2002

3RD ANNUAL INSPECTION REPORT ON MARINE FINFISH AQUACULTURE SITES

JOINT REPORT OF

Ministry of Agriculture, Food and Fisheries

AND

Ministry of Water, Land and Air Protection

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1. EXECUTIVE SUMMARY

Agencies with key functions relative to the aquaculture sector include the Ministry of Agriculture, Food and Fisheries (MAFF), the Ministry of Water, Land and Air Protection (MWLAP), the Ministry of Sustainable Resource Management (MSRM), Land and Water British Columbia (LWBC) and Fisheries and Oceans Canada (DFO).

The key development in 2002 relative to our compliance and enforcement program was implementation of a Service Agreement between MWLAP, MSRM, LWBC and MAFF. The Service Agreement co-ordinates responsibilities between these agencies to reduce duplication of effort, increase efficiencies and demonstrate a strong integrated and accountable compliance and enforcement regime. Details of the Service Agreement and enforcement matrix are provided later in this report and provide the rationale for the first joint report on compliance and enforcement for finfish aquaculture.

For the purpose of this Service Agreement, MAFF has the lead role in compliance and MWLAP the lead role in enforcement. As part of MAFF's commitment to this Service Agreement, for 2002, MAFF Inspectors completed the first round of MWLAP-related inspections at 24 salmon farms. During site inspections, MAFF Inspectors examined MWLAP responsibilities relating to protection of the marine environment, including:

- waste discharges;
- storage and discharge of mortalities;
- handling of blood water;
- disposal of refuse; and,
- licensing and use of fire arms.

The BC *Fisheries Act* and *Aquaculture Regulation* are administered by MAFF, which has the responsibility to regulate operational aspects of salmon farming, including the following activities:

- escape prevention and escape response;
- farm record keeping requirements;
- net maintenance activities;
- general farm site operations; and,
- compliance with licence terms and conditions.

Pursuant to the new Service Agreement and MWLAP's role as the lead agency for enforcement, between March, 2002 and March, 2003, a total of 18 case files were referred to MWLAP by MAFF Inspectors for follow-up and investigation.

Important changes to the *Aquaculture Regulation* were also made in 2002. Prior to October 31, 2000, regulatory requirements related to escapes and farm practices were fairly general. The regulation required a licence holder to take reasonable precautions to prevent the escape of fish and to report escapes. In the absence of more detailed regulatory requirements, MAFF Inspectors had to review on-site activities and subjectively determine if those activities were consistent with known industry standards in order to assess the state of compliance.

In recent years, the *Aquaculture Regulation* has been amended twice in an effort to provide more specific standards and guidelines that could be effectively used to measure the state of industry compliance. The first of these amendments was introduced on October 31, 2000. On April 19, 2002, further changes were introduced that built on the previous regulations. Some of the more substantive changes included in the April 2002 amendment package are described on page 14 of this report.

For the 2002 inspection cycle, MAFF completed inspections at 85 active salmon farms operating on 82 tenures. Overall, Inspectors found compliance with new regulatory requirements was above 90 percent. There are still, however, areas where improvements are required. Some of these relate to farm site operations, such as failure to secure the water line ropes, failure to provide proper signage at designated dock sites and failure to conduct net inspections prior to the introduction of fish.

In other cases, there was non-compliance with record keeping requirements, in particular net maintenance and history records. Much of the non-compliance encountered relating to record keeping requirements could be attributed to industry not having the opportunity to comply with the new standards that were introduced in the regulatory amendment of April 2002. The specifics of non-compliance in this area included failure to properly tag nets, lack of information on the last out-of-water servicing and failure to keep some of the required records at the farm site.

Another area of non-compliance pertains to failure of some licence holders to ensure that escape recapture plans include arrangements to obtain prior approvals for any attempted recapture. To facilitate industry meeting this requirement, DFO developed a ZZA licence specifically for the recapture of escaped Atlantic salmon. The licence is not site specific and is issued to a company. The ZZA licences were to be issued only for the recapture of Atlantics and it was intended that specific licence conditions would be attached to each licence to protect endangered stocks. During the 2002 inspection cycle all eligible companies applied for this ZZA licence, however, DFO did not issue any licences in 2002 because they did not have their administration in place. Technically, none of the companies complied with the requirement, however, all but 5 who were raising only Pacific salmon made the attempt to comply and they were not eligible to be licensed.

Inspectors found a high compliance level to general licensing requirements as well as to any related special provisos attached as licence conditions. The 2001 annual report described results based on the broad category of "Management Plan" compliance. For 2002, compliance results are broken down into specific areas, namely the four management plan categories that are assessed on site: possessing a current licence, having appropriate licensed species on site, maximum production or biomass, and, finally the configuration of the site in question relative to placement of net cages, etc. One area of improvement in 2002, over findings in 2001, was a higher number of operations which were compliant with biomass levels identified in the site-specific management plans. The one aspect with the overall highest non-compliance rate, and where improvements over 2001 were not evident, was consistency between what was approved in the management plan for site configuration, (the number and size of net cages on site), and what was actually observed on site.

At the time of writing this report, management plan amendment applications have been submitted by companies for the majority of the sites in question. In some cases, amendment applications were submitted well before the site inspection date but had not been approved at the time of inspection. These amendments, once approved, should address the noted non-compliance issues. The high level of non-compliance in this area is generally attributed to companies which introduce changes on-site before the approval process is completed. Companies have criticized MAFF for the amendment procedures that the companies feel are burdensome, untimely and do not meet their operational needs.

Analysis is underway to review public interest objectives relative to management plan elements. MAFF will continue to monitor management plan elements to ensure compliance in these areas pending further policy development in this area. More discussion on this issue can be found in Section 5C of this report.

As noted earlier, MAFF conducted a total of 24 inspections to determine compliance with MWLAP regulatory requirements. For the 2003 inspection cycle which is well underway, MAFF inspection staff will be assessing MWLAP regulatory issues for all sites.

Results of the 2002 inspection cycle indicate, in general, a high level of compliance for the 24 sites inspected. Companies and sites inspected for MWLAP areas of responsibility are provided in ***Appendix 8.***

In summary, overall inspection results for 2002 indicate a high level of compliance with a few exceptions. Compliance and Enforcement staff at MAFF and MWLAP are continuing to address these issues to ensure industry is meeting government requirements.

2. INDUSTRY BACKGROUND

For 2001, total landings and production for farmed salmon was estimated at 67,700 tonnes. This is up from 49,400 tonnes in 2000. This volume equates to a landed value of $269 million and a wholesale value of $291 million.

The total landings and production levels for farmed finfish reflect production from a portion of the 121 licensed marine aquaculture farms in British Columbia. At any given time a percentage of the licensed sites are being fallowed and are not operational.

Licensed tenures are located in these areas of the province:

- Northern Vancouver Island – 39 sites;
- East Coast of Vancouver Island – 31 sites;
- Clayoquot Sound – 26 sites;
- Sechelt coastal waters – 10 sites;
- Mainland North of Cape Caution - 3 sites; and,
- the remaining 12 sites are scattered in various locations throughout British Columbia coastal waters

During the 2002 inspection cycle there were 85 operational sites inspected at 82 licensed locations. The remainder were fallow for this inspection cycle or were inoperative for other reasons. "Fallow" sites are those finfish aquaculture farms that are inactive to allow the seabed to recover from any organic input prior to stocking the next production cycle, and ensure that operations are compliant with performance-based waste standards prescribed by MWLAP.

The following graph provides the breakdown for species currently being held on provincially licensed fish farms.

GRAPH 1
PIECE COUNTS

3. OVERVIEW OF LICENSING AND COMPLIANCE PROGRAM - 2002

MAFF's Licensing and Compliance Branch's mandate recognizes the need for transparency and accountability. This mandate is met by the application of an integrated licensing and compliance program that applies personal and institutional independence decision-making principles to meet our public interest objectives.

A key function of the Licensing and Compliance Branch is the receipt and adjudication of commercial seafood applications and the issuance of licences and permits for the following industries:

- finfish aquaculture operations and hatcheries on both private and Crown land, including freshwater operations;
- shellfish aquaculture operations and hatcheries on both private and Crown land;
- commercial seafood activities, including fish buying stations, fish and marine plant processing and cold storage facilities, fish vendors and fish brokers;
- commercial harvest of marine plants and wild oysters.

A. LICENSING:

With respect to the review of new salmon farm licence applications, including relocations, the licensing procedure is thorough and complex. Considerable review is required to determine if the proponent's application meets identified policy criteria. General principles guiding the deliberations on salmon farm applications include: fairness, transparency, efficiency, and accountability.

The key values that are applied and considered by licensing officials include:

- protection of public health and safety;
- protection of the environment; and
- sustainable economic development.

The licensing policy, attached as ***Appendix 2*** to this report, provides the guidelines applied by the licensing authority in considering licence applications.

Inherent in the licensing decision review process is consideration of the past or demonstrable performance of the applicant which includes a review of compliance history. This includes consideration of the following factors:

- whether the applicant has had any previous convictions under relevant provincial legislation;
- whether the applicant has been the subject of any licence suspensions, cancellations or refusals to licence pursuant to the BC *Fisheries Act*;
- whether there are any outstanding fees or royalties owed to the Crown with regard to current or previously held aquaculture licences; and,
- whether the applicant has the necessary experience and qualifications in the aquaculture sector.

Information and data collected during annual inspections, the dive audit program and through previous investigations provide licensing authorities with critical information relative to the past or demonstrable performance of the applicant.

The Licensing and Compliance Branch also has the responsibility to:

- monitor, inspect, and report on commercial fisheries and finfish and shellfish aquaculture industries.

As noted earlier, a significant addition to MAFF's Licensing and Compliance Program in 2002 was the development and implementation of the inter-agency Service Agreement. The Service Agreement was developed to reduce duplication of effort, increase government efficiencies and to demonstrate a strong, integrated and accountable compliance and enforcement regime.

The goals of the Service Agreement include:

- efficient use of staff resources to minimize duplication;
- one window approach to aquaculture development;
- high level of compliance;
- early intervention to avoid non-compliance;
- effective enforcement, successful prosecution and rehabilitation where required;
- public confidence; and,
- transparency.

The Service Agreement specifies that MAFF inspection staff serve as the lead in developing site specific management plans and conducting all finfish and shellfish inspections, monitoring and audits on behalf of MWLAP, LWBC and MSRM. MWLAP enforcement staff serve as the investigative lead on all enforcement activities associated with formal prosecutions, court orders and administrative penalties for finfish and shellfish aquaculture on behalf of MAFF, LWBC and MSRM.

MWLAP continues to conduct environmental monitoring of benthic conditions at and near farm sites as part of its compliance program and to support collection of further scientific information that will be used to evaluate the effectiveness of the standards prescribed in the *Finfish Aquaculture Waste Control Regulation*.

A compliance matrix was developed in 2002 to provide guidance to staff when addressing non-compliance issues. Specific compliance issues are defined in the matrix, along with the action required to be taken by the licencee to achieve compliance. The matrix also indicates what information will be required by the Inspector to confirm that the issue is being resolved, as well as provide guidance as to the appropriate enforcement response to apply.

While the matrix provides specific guidance, it is important to recognize that inspectors/officers evaluate each incident of non-compliance on its own merits and, based upon the specific fact pattern, decide an appropriate course of action.

The details of the service and enforcement agreement can be found in ***Appendix 1*** and details of the compliance matrix can be found in ***Appendix 12*** of this report.

B. LICENSING RELOCATIONS:

As part of the provincial Salmon Aquaculture Policy, the provincial government committed to relocating farms that were inappropriately located. With recent improvements in science and increased knowledge of the effects of net cage aquaculture, government and industry now have a better understanding of those factors that make an area suitable or unsuitable for aquaculture.

Since 2000, government and industry have identified a total of 37 salmon farms that should be relocated to more suitable sites. These 37 sites were identified based on consideration of a number of environmental, social and economic factors.

Environmental factors included the site's proximity to salmon-bearing streams, kelp beds, herring spawn areas, shellfish beds and other sensitive marine habitat.

Social factors included proximity to parks or other protected areas and proximity to First Nations reserves. Consideration was also given to environmental factors such as current speed and waste dispersal, the site's susceptibility to algal blooms, known conflicts with nearby residents or resource users, and proximity to industrial pollution sources. Economic factors consider benefits to coastal communities that may arise from moving a site to a more suitable area.

Farm relocations comply with new, stricter environmental standards and will ensure the continued protection of wild fish, marine mammals and other wildlife. Relocating poorly sited farms will also reduce the potential for social conflicts with other marine resource users.

A comprehensive list and status of the salmon farm relocation initiative is attached as ***Appendix 3***. Regular updates and can be found at the following web site:

http://www.agf.gov.bc.ca/fisheries/siting_reloc/relocation.htm.

A guide for completing site applications that will outline more stringent siting, monitoring and reporting requirements has also been developed. The Guide to Information Requirements for Marine Finfish Aquaculture Operations is complete and has been available at the MAFF website since June 2003.

C. COMPLIANCE AND ENFORCEMENT:

i. MAFF

In keeping with the newly developed Service Agreement, the compliance and enforcement regime for MAFF Inspection and Compliance staff includes:

- promoting awareness, education, and training;
- promoting industry best practices;
- developing cooperative partnerships and agreements contributing to government objectives;
- conducting monitoring, inspections and audits;
- referring and assisting MWLAP in conducting investigations on alleged legislative and/or licensing violations; and
- reporting publicly on the compliance status of salmon farm inspections.

ii. MWLAP

MWLAP's compliance and enforcement program for the finfish aquaculture industry includes:

- developing and communicating standards to protect human health and safety and to maintain and restore the natural diversity of ecosystems, and fish and wildlife species and their habitats;
- conducting environmental monitoring and evaluating environmental monitoring results (government and industry);
- conducting legal investigations to address non-compliance with regulatory standards; and
- public reporting on the compliance status of salmon farm inspections.

Government continues to review opportunities to improve its compliance and enforcement program in order to meet its commitment for an aquaculture industry that has high standards for environmental protection.

With the above in mind, a number of enhancements to government's inspection and compliance program were implemented during the 2002 inspection cycle. These included:

- Signing of the joint agency Service Agreement, on the Co-ordination of Compliance and Enforcement Programs (***Appendix 1***) that defines the roles and responsibilities in finfish and shellfish aquaculture.

- Relocation of MAFF's Senior Fisheries Inspector position from Victoria to Courtenay to reflect the need for an enhanced Senior Inspector presence in the regional field office.

- Joint training for MAFF Inspectors and MWLAP Conservation Officers in June, 2002, based on commitments identified in the Service Agreement.

- Designation of MAFF Inspectors as Special Conservation Officers on November 27, 2002. Designation provides authority for Inspectors to assess compliance and conduct inspections on behalf of MWLAP and to issue violation tickets for MWLAP offences based on prescribed violations (including *Waste Management Act*, *Wildlife Act*, *Water Act*, and *Environment Management Act*).

- Bringing into force amendments to the *Aquaculture Regulation* in April 19, 2002. Building on the amendments introduced in October 2000, the new regulation focuses on preventing escapes and promotes a framework of environmental standards and practices.

- Implementation of the *Finfish Aquaculture Waste Control Regulation* on September 12, 2002, replacing the *Aquaculture Waste Control Regulation*. The new regulation provides additional standards for environmental protection.

- Comprehensive review of containment nets that identified minimum breaking strength requirements and development of a standard net testing procedure. ***Appendix 4*** describes the standardized net cage mesh strength testing procedure. The detailed consultant report can be found at the following link:

  http://www.agf.gov.bc.ca/fisheries/regulation/net strength study.pdf

- Continued MWLAP environmental monitoring of sediments at or near farm sites.

- Development and Approval of a Licence Suspension/Cancellation, policy protocol (***see Appendix 14***).

Enhancements – continued:

- Addition of two MAFF Fisheries Inspectors to reflect increased workload associated with finfish and shellfish aquaculture case file loads.

- MAFF training in electro-shocking and rapid water survey methods that can be applied to stream surveys.

- MAFF acquisition and training in the use of an underwater remote operated vehicle (ROV).

4. MANDATE

A. MINISTRY OF AGRICULTURE, FOOD AND FISHERIES - LEGISLATIVE AND REGULATORY FRAMEWORK

Fisheries Act

The (BC) *Fisheries Act* provides the authority for MAFF to license aquaculture operations and regulate on-site farming activities. It also provides MAFF with the authority to set out licensing requirements such as species and production limits approved for each operation, and any additional terms and conditions that might be appropriate.

Aquaculture Regulation

The *Aquaculture Regulation* establishes regulatory requirements for specific on-site farm activities. These requirements in general identify a minimum standard with which farm operators must comply. The *Aquaculture Regulation* has undergone several changes, the most recent of which came into force on April 19, 2002.

Some of the more substantive changes include the introduction of:

- new powers allowing provincial Aquaculture Inspectors to have suspect net cages removed from the water;
- streamlined record keeping requirements for salmon farms;
- increased flexibility around diving requirements that link dive inspections more closely to higher-risk activities or events such as severe storms;
- requirements for farms to develop best management practices plans to guide routine activities that could lead to escapes; these replace similar but less effective requirements that were in the October 2000 amendments;
- changes to minimum net-strength standards, making them more consistent with other jurisdictions;
- a mandatory net-strength testing protocol, making net-strength requirements more enforceable; and
- increased emphasis on staff training, based on research that suggests human error is a leading cause of escapes.

The *Aquaculture Regulation* can be found in ***Appendix 5***.

B. MINISTRY OF WATER, LAND AND AIR PROTECTION - LEGISLATIVE AND REGULATORY FRAMEWORK

As noted earlier, the 2002 inspection cycle marked the first year where MAFF Inspectors conducted inspections on behalf of MWLAP and MSRM under the new Service Agreement.

The focus of these inspections is directed at compliance with legislative and regulatory requirements under pertinent Acts and Regulations administered by MWLAP ensuring protection of the marine environment.

Inspection activities included reviewing compliance with waste management requirements dealing with:

- domestic sewage;
- disposal and storage of fish mortalities (morts);
- transport, disposal and storage of blood water;
- disposal of refuse and other wastes;
- storage of hazardous materials; and,
- control of predators through the use of trapping and firearms.

There are a number of Acts and associated regulations regulating these issues:

- *Waste Management Act*
- *Finfish Aquaculture Waste Control Regulation*
- *Wildlife Act*
- *Water Act*
- *British Columbia Fire Code Regulation*

Waste Management Act

The *Waste Management Act* regulates the discharge of waste into the environment. Waste is defined as refuse, effluent, or air contaminant, capable of impacting human health, or the environment. The Act prohibits all waste discharges, except discharges conducted in accordance with a permit, approval, or an applicable regulation.

Possible waste discharges from salmon farms include sewage, fish faeces, fish feed, refuse, mortalities (dead fish), blood water, net cleaning waste, used disinfectant from footbaths, and fuel spills.

In September of 2002, the *Finfish Aquaculture Waste Control Regulation* (FAWCR) came into effect, replacing the *Aquaculture Waste Control Regulation*. The FAWCR requires all operating farm sites to be registered with MWLAP prior to stocking a facility with finfish.

Farms are required to implement a Best Management Practices Plan to address the management of potentially harmful materials, promote the reduction of the discharge of wastes and pollutants, prevent the attraction of wildlife to feed, foodstuffs and mortalities, collect and dispose of mortalities in a timely fashion and in a manner to prevent spillage to the environment and minimize odours during storage and transportation.

The FAWCR establishes standards for the discharge of domestic sewage from farm sites and requires the operator to maintain records related to the construction, operation and maintenance of sewage treatment and disposal works.

The FAWCR also has provisions requiring environmental monitoring of sediments and reporting of monitoring results. It establishes chemical and biological standards for sediments at farm sites and defines when farms can be restocked based upon specific sediment conditions.

Wildlife Act

The *Wildlife Act* and the *Wildlife Act Commercial Activities Regulation* deal with trapping of fur bearing animals by licensed trappers and landowners. Fur bearing animals such as mink and river otter that become conditioned to feeding on farmed fish may be trapped by a licensed trapper during the open season or during closed season with authority from the Regional Wildlife Manager.

The *Wildlife Act* also regulates hunting and requires a person to hold a licence when hunting wildlife.

Water Act

Agencies that share a role in administering and regulating activities related to the *Water Act* include MSRM, LWBC and MWLAP. MSRM is responsible for taking water resource issues into consideration during planning processes. LWBC is responsible for addressing compliance issues and MWLAP continues to undertake enforcement activities in consultation with LWBC.

The *Water Act* regulates the use of surface water for domestic, industrial and commercial use. A water licence is required in order to use surface water for domestic use in industrial settings such as marine fish farms.

British Columbia Fire Code, 1998

The BC Fire Code, administered by the BC Office of the Fire Commissioner, requires 110% containment for flammable or combustible liquids. The 110% containment requirement of the Code supports the *Waste Management Act* and its regulations in regards to spill prevention measures.

5. METHODOLOGY

A. INSPECTION ACTIVITIES

While inspections can occur at any time during the year, most annual inspections are completed between the months of May and October. The objective of these inspections is to measure compliance with regulatory requirements and licence terms and conditions as set out in the Aquaculture Licence issued by MAFF.

An Inspector will visit every active salmon aquaculture site a minimum of once a year. Some farms may be subject to repeat inspections; in particular if there is an open investigation or ongoing non-compliance issues are being encountered.

An inspection form, ***Appendix 6***, and compliance report, ***Appendix 7***, are completed by the Inspector for every inspection at an active salmon aquaculture site.[ii]

Inspection form: The inspection form is primarily designed for the use of the Inspector and assists with reviewing the site's compliance with regulatory requirements. The inspection form also forms part of the record of the site's compliance history.

Compliance Report: The compliance report is filled out at the time of inspection and a copy of this form is left on-site with the site manager or their designate. The compliance report details any deficiency, identifies the relevant regulatory requirements, specifies the corrective measure to be implemented and identifies the time frame for expected compliance.

Notification: The company headquarters will be notified as soon as practical and in writing of the results of each inspection. A copy of the compliance report that was completed on-site will be provided along with any other applicable compliance information. The notification letter that is sent to the company requests that the company responds to the identified deficiencies within a specified time frame. Companies are also requested to provide written notification once corrective measures have been implemented.

Review and Sign-off of Corrected Deficiencies: Once the Inspector has received notification that the company has corrected the identified deficiency; the Inspector must verify compliance in writing. This verification procedure may or may not involve a site visit depending on a number of factors including the nature of the deficiency.

On-site Inspection Procedure: During the on-site inspection, Inspectors interview company officials and review the farm's operational procedures and maintenance records for completeness and compliance with the regulation. The Inspector also performs an above-water visual examination of the site, including a perimeter inspection of each containment pen and infrastructure including anchors, walkways and other associated hardware.

In addition, each year, spot dive audits are conducted at a limited number of randomly selected sites where a dive team is contracted to review the underwater portion of the containment and anchoring system. Details and the results of the dive audit are described later, in a separate section of this report.

B. KEY COMPONENTS OF THE ON-SITE INSPECTION – MAFF REGULATORY ISSUES:

Management Plan, Terms and Conditions, and Licensing: The management plan is a document the farm operator is required to submit that specifies design and operation criteria of the fish farm. Management plan applications undergo extensive reviews and, once approved, compliance with the plan is a condition of the site specific Aquaculture Licence. Companies are required under the BC *Fisheries Act* to operate within the provisions approved in these plans.

During the on-site inspection, the Inspector will assess compliance with the Aquaculture Licence and related management plan by observing and detailing site specific information. The Inspector will compare these observations against the most current management plan to determine compliance. This assessment includes information on biomass, species cultured, site configuration, licensing and any special provisos that may be attached as a condition of licence.

Escape Reports: The company must provide information on any escape events that have occurred in the last 12 months. While escapes must be reported within 24 hours to the Licensing and Compliance Branch, on-site inspections provide opportunities for Inspectors to audit this requirement by reviewing on site records and to question farm site employees or managers.

Inventory Records: The companies are required to keep accurate and complete inventory of stock on hand for each net cage. These records must be maintained until that stock is removed from the site.

Inspection Records: Farm operators are required to conduct specific inspections on-site as part of the precautionary measures to prevent escapes. Regulations require these inspections to be documented and records must be kept on-site and produced at the request of an Inspector.

Best Management Practice Plan (BMP): Companies are required to develop these plans for each site. The BMP must include a description of specific practices and procedures used to prevent fish escapes during higher risk activities conducted at the farm site.

Amendments to the *Aquaculture Regulation* establishing the BMP requirement came into effect at the end of October, 2002, and therefore were not part of the 2002 compliance review. Industry's compliance will be assessed in 2003.

Escape Response: Inspectors verify that the company has developed and posted an escape response plan. Farm staff are often questioned to determine if they can accurately describe the contents of these plans.

Therapeutant Use and Records: On-site inspections provide an opportunity to ensure that therapeutant usage on the farm site is properly documented and these records are properly maintained.

Installation of Containment Structures: A walk-around inspection is conducted in which the Inspector ensures that the cage support equipment is designed, installed and maintained to prevent entanglement and chafing against containment nets, predator nets and shark guards.

Each year the ministry also conducts a random dive audit at a selected number of sites. Dive audits provide an additional opportunity to examine the underwater infrastructure for these inspection points in more detail. Information on this year's audit program is described later in the report.

Net Cage Configuration & Storage: The installation of the net cage is examined to ensure that the net cage is properly installed, the tie off points are secure, the jump net is the required height, the net is the proper mesh size and there is sufficient weight on the net to prevent excessive billowing. Net storage is also reviewed to ensure nets are properly stored and under protection.

Net Cage Inspections: The Inspector reviews the condition of the net cage to determine if the nets are properly tagged with an inventory control number and repairs are carried out as required. The Inspector also determines if the company is compliant with the specified net cage inspections and the required frequency of these inspections.

The Inspector may also order or conduct additional net strength testing if there is any concern or issue over the integrity of any net cage. This may involve on-site testing or a request by the Inspector to remove the net for a complete out-of-water servicing.

Boat Docking: Inspectors review areas where boats tie up to ensure they are designed to prevent propeller damage to net cages and that proper signage has been provided to identify these as designated boat moorage areas.

Fish Handling: If fish are being harvested or handled, the Inspector ensures that the company complies with requirements to have spotters and use catch nets to help prevent accidental loss of fish through human error.

Predator Control: The Inspector reviews the predator control program for the farm site to ensure that the operator has responded to any repeated predator attacks by implementing additional measures to prevent damage to the containment structures that might lead to loss of stock.

B. KEY COMPONENTS OF THE ON-SITE INSPECTION – MWLAP REGULATORY ISSUES:

Blood Water Disposal: The Inspector reviews fish handling procedures with the operator and in cases where fish are bled on-site the Inspector will determine how the farm operator disposes of or contains the blood water.

Net Treatment, Cleaning and Waste Disposal: The Inspector examines net handling procedures to determine the location and manner in which containment nets are handled and cleaned to remove marine growth.

Disinfectant Use and Disposal: The type of disinfectant the farmer uses to treat equipment or in foot baths to prevent the spread of fish disease is investigated by the Inspector. Storage methods, use, disposal and any treatment prior to disposal are examined.

Mort Storage and Disposal: The Inspector determines where fish morts are stored after they are collected from individual net pens. Where morts are stored on-site the Inspector reviews storage methods as well as the frequency of mort removal. Final destination of the morts is determined to ensure proper removal and disposal.

Refuse Storage and Disposal: The Inspector reviews disposal methods and determines the disposal location of domestic or industrial refuse produced on the salmon farm.

The above items are addressed within the *Finfish Aquaculture Waste Control Regulation* and are to be managed through a Best Management Practices Plan.

Sewage Treatment and Disposal: The Inspector determines the method of domestic sewage disposal and ensures proper authorization is in place if required. In addition, the Inspector reviews any required documentation or sewage maintenance records.

Water Use and Licensing: The Inspector determines the source of domestic water supply to ensure that, where required, the proper water use licence is in place.

Wildlife Predator Trapping: Trapping wildlife that prey on farmed salmon is occasionally arranged by the salmon farm operator. The Inspector determines the number and species trapped, how they are trapped, the trapper's name, and will ensure that a proper permit is in place for this activity.

Predator Management: Occasionally problem mammals that prey on farmed salmon are destroyed with firearms as approved by DFO. Inspectors review usage of firearms at the farm site.

Fuel Product Use, Storage and Containment: The Inspector reviews fuel storage on site to determine if the fuel is securely stored in an environmentally safe manner and that diesel tanks have a minimum 110% containment or other adequate containment method. Inspectors also determine whether the operation is otherwise in compliance with the applicable section of the BC Fire Code.

Environmental Management: The Inspector determines if a spill contingency plan is available on site, reviews the plan, and determines whether adequate spill equipment is present to support the plan.

In 2003, MAFF inspectors will undertake inspections to determine compliance with the requirements of the *Finfish Aquaculture Waste Control Regulation* for all active sites in the province.

C. COMPLIANCE RATES – REGULATORY AND LICENSING REQUIREMENTS

PART #1

MAFF REQUIREMENTS

A. Management Plans and Licensing

Every aquaculture facility must have an approved management plan in order to obtain an aquaculture licence. The holder of an aquaculture licence must comply with the approved plan. Failure to follow the plan is deemed non-compliant with licence conditions and is subject to enforcement action.

The management plan for each fish farm specifies design and operation criteria. Management plan applications undergo an extensive review and once approved, form a condition of the aquaculture licence. Companies are required under the BC *Fisheries Act* to operate within the provisions approved in these plans.

Several aspects of the management plan that MAFF Inspectors reviewed for compliance this inspection cycle include: the number and size of the pens that are on site and their lay-out (or site configuration), the species being cultured, the biomass levels on site, and the licence status and compliance with any special provisos that are attached as a condition of licence.

The compliance level for most of the above aspects, except for biomass levels and site configuration, was 90 percent or greater. While an improvement was evident over the 2001 numbers for biomass levels the same level of improvement for compliance with net cage configuration was not evident.

Site configuration and biomass levels are interrelated factors and two of the components that are considered together when establishing an estimate of the biomass capability of a site. These numbers are determined through a modelling process and are established in anticipation of meeting performance-based standards for that particular site. The true determination of the environmental impact of the amount of fish or biomass at any given site, however, is the indicator of ***organic loading*** regulated under the *Finfish Aquaculture Waste Control Regulation*. Future harvest tonnage at a particular site will be adjusted to comply with performance-based standards and could be higher or lower than initially established biomass numbers.

Once elements of the management plan are approved, the company's compliance with these criteria is a condition of licence. Before implementing any changes to the on-site operations that are components of an approved management plan, the company must obtain approval through a formal application procedure. In many cases industry has not followed this procedure and has made changes prior to and in some cases without seeking approval. In 2002 this was particularly evident with net cage configuration, and, to a lesser degree, biomass levels.

The management plan is a key element in establishing and maintaining performance-based standards for environmental sustainability, stewardship and compliance. The plan and accompanying information is used by biologists in the Aquaculture Development Branch (ADB) to analyse the technical feasibility and biophysical capability of proposed and existing fish farm operations. ADB then makes recommendations to statutory decision makers in the Licensing and Compliance Branch (LCB). LCB uses the plan to establish conditions of licence under the BC *Fisheries Act*, and as a compliance measure under that and other attendant acts and regulations. LCB has the authority and the capacity to inspect fish farm operations for compliance with the plan.

Non-compliance with the operational conditions of a plan may, in some cases, have the potential to result in negative effects to the marine environment as well as the environmental sustainability of the operation itself. This can result from having more that the approved maximum biomass, or by altering the approved cage system configuration so that it no longer makes optimal use of the biophysical attributes of the site to avoid environmental impact. There may be technical concerns, as well, if there is variance from the originally approved engineering specifications in the plan. Variance from the plan may also put the operation in conflict with the siting criteria (e.g. proximity to salmonid streams or sensitive habitat) under which the original plan was approved.

In other instances, having too few or too many cages or a different system configuration that does not exactly match the approved plan, while technically non-compliant, may not necessarily pose environmental or siting concerns. This is particularly true of operations that have not yet reached maximum production or are within their approved maximum production levels.

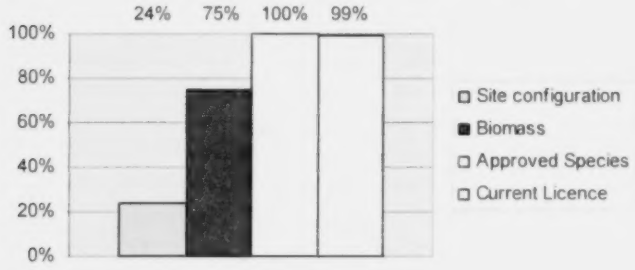
With this in mind, a review is under way at MAFF on internal administrative procedures in an effort to streamline management plan amendments and timelines for review and approval, and to develop policies and procedures on performance objectives that are important from an environmental sustainability perspective. MAFF also recognizes that improvements to licensing timelines should be achieved. In some cases, delays are due to referrals to other agencies, First Nation consultation obligations, or both.

Once developed, these objectives will be discussed with appropriate regulatory agencies and industry representatives. For example, performance objectives may be based on the relationship between approved biomass and containment area, as well as the siting criteria in the management plan guide. Any variation from the plan that does not meet the objectives would be subject to enforcement action. For example, variations from the plan that meet environmental performance objectives but may present technical or siting concerns would be dealt with outside the plan through a streamlined amendment process.

Having said this, MAFF continues to be committed to ensuring that on-site operations reflect the approved conditions identified in a company's management plan. The compliance and enforcement approach applied to the 2002 inspection year will continue in 2003 recognizing the above noted review and associated development of policy. In some cases, a number of enforcement sanctions have been initiated for continued and repeat non-compliance in this area.

Graph 2 illustrates compliance rates with the management plan and licensing requirements. It shows specific compliance rates with various factors including current licensing, approved species on site, net cage configuration and biomass.

GRAPH 2
COMPLIANCE WITH MANAGEMENT PLAN CRITERIA



B. Escape Reports

The *Aquaculture Regulation* requires that fish escapes or suspected escapes be reported to MAFF verbally within 24 hours and in writing within one week from the date of discovery. On-site inspections provide the opportunity for Inspectors to interview site employees and view log entries and other farm documents to assess compliance with this requirement.

On occasion, escape events or suspected events are encountered that have not been reported. Usually, numbers in these cases are small and are isolated instances where fish have been lost during handling or harvesting operations.

As all escapes are viewed as serious, these isolated instances are investigated and where warranted referred to WLAP for further investigation.

During the 2002 inspections, six unreported escape or suspected escape incidents were encountered. Some of these incidents led to subsequent investigations and charges while warning notices were issued for others.

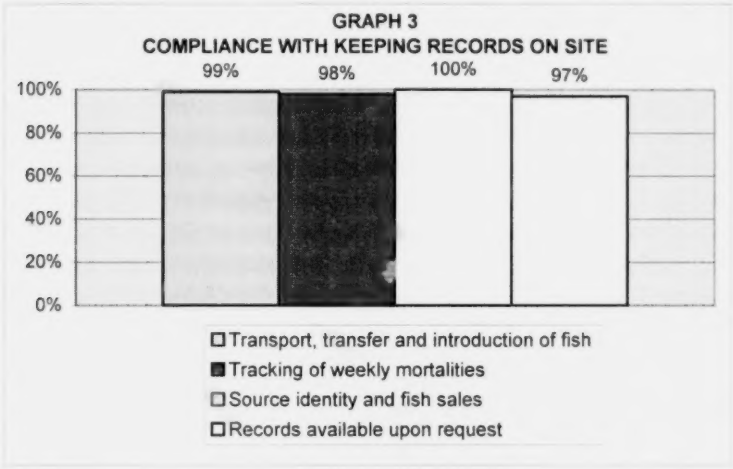
C. Stock Inventory Reports and Record Keeping[iii]

The *Aquaculture Regulation* requires that licence holders keep accurate and complete inventory records of stock on hand and requires these records to be maintained for each net cage on the system. These records must show the inventory introduced to the farm site, the source of the stock and documentation should reconcile any fish transferred in or out, including escapes and mortality.

The objective of this requirement is for the farm operator to know at any given time what the stock levels are for each net cage on the farm. This is not only important from an animal husbandry perspective but also to enable the operator to more accurately assess and report incidents of escape, and provide a measure of compliance with approved biomass. Accurate records are also important for the statistical database that MAFF maintains.

The inspection team does not complete detailed forensic audits and reconciliation of inventories with paper documentation. Instead, compliance is based on evidence presented by the farm operator, to the satisfaction of the Inspector that these records are being kept in the manner prescribed. Part of the regulatory requirement also assessed is the requirement for these records to be kept on-site and made available for the Inspector upon request.

Inspectors found that at 85 sites inspected, operators at 84 sites were maintaining records of transport, transfer and introduction of fish as required, at 83 sites they were accurately tracking weekly mortalities, at all 85 sites records of source identity and fish sales were being maintained and at 82 sites these records were available on request.



D. Inspection Records[iv]

Inspection records are important not only for the farm operator as a method to review daily activities and for keeping a history of maintenance activities, but it also provides an audit tool so Inspectors can verify that the operator has complied with specific inspection points.

There are a number of key record keeping requirements specified in the *Aquaculture Regulation*. This section examines the compliance with the requirement to maintain daily logs of inspection activities, any inspections that occur after a high risk activity and net maintenance records.[v]

Records of Visual Inspections – Equipment:

The *Aquaculture Regulation* contains a variety of record keeping requirements, including documentation of daily visual inspections or any inspections conducted after an occurrence that might be considered as creating a higher risk of escape.

Record keeping requirements for visual observations include: daily records of all above water inspections of cage support systems, any inspections completed after extreme environmental conditions, and high risk activities such as net cage changes, fish delivery, recurring predator attacks, and vandalism to net cages or equipment.

This information must be kept on site for one year from the date of recording and must be presented to an Inspector upon request.

Records of Net Maintenance:[vi]

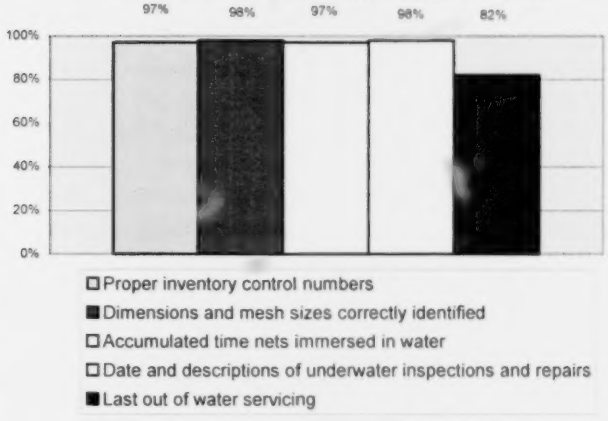
The *Aquaculture Regulation* requires that specific information is collected and maintained for each containment net on site.

Net maintenance records include specific details such as: net inventory number, dimensions, mesh size, the accumulated time in the water since the most recent out of water inspection, a description and the dates of each underwater inspection performed since the most recent complete out of water servicing and inspection, and a description and date and reasons for all recent repairs. As well, the operator must have details on the most recent out of water service record for each net on site.

Many of these records must be kept on site and must be produced at the request of an Inspector.

Inspectors found that at 82 sites inventory control numbers were properly recorded, at 83 sites dimensions and mesh sizes were correctly identified, at 82 sites records of accumulated time that nets are immersed in water were available, at another 83 sites the descriptions, dates of underwater inspections were recorded as well as description, dates and reasons for all these repairs. At 70 sites operators were able to supply last out of water service records.

GRAPH 4
COMPLIANCE WITH NET MAINTENANCE RECORDS



E. Best Management Practices Plan

As noted earlier in this report both the *Finfish Aquaculture Waste Control Regulation* and the *Aquaculture Regulation* contain requirements for marine fish farms to implement Best Management Practices Plans (BMPs). The regulations also provide 180 days for farms to implement these plans, after the regulation is proclaimed.

Under the *Aquaculture Regulation*, the requirement to have a plan in place came into effect in late October, 2002 and the requirement for a BMP under the *Finfish Aquaculture Waste Control Regulation* came into effect in March, 2003.

At the time of 2002 inspections, it was not a mandatory requirement for operators to meet these new regulatory requirements. The intent was to provide time for industry to develop necessary plans. Compliance with this requirement was not evaluated during the 2002 inspection cycle.

The purpose of the BMP requirement under the *Aquaculture Regulation* is for the companies to identify and address operational procedures to prevent escapes. Companies must develop and follow a written BMP for the operation and maintenance of their marine finfish facilities. Operation procedures identified in the BMP must be consistent with or exceed practices described in Appendix 2: Standards of Practice for Marine Finfish Aquaculture Escape Prevention and Response in the *Aquaculture Regulation*.

The BMP will identify how a wide range of operational activities are to be carried out. These will include as a minimum, finfish delivery, handling and grading, net cage changing, boat operations and maintenance, towing containment structures, management of predation and recovery of mortalities.

All of these activities carry some risk, so it is critical that the BMP is developed to address these issues. All employees must understand and follow the BMP at all times.

Any time there is a change in the operation of the marine finfish aquaculture facility the BMP must be updated to reflect these changes. Companies should periodically review operational procedures to ensure consistency between on-site operations and what is described in the BMP.

Detailed summary information is provided in ***Appendix 10*** on common causes of escapes.

F. Escape Response

Every operator must have a written escape recapture plan. To initiate an effective escape response, staff must be well trained in the elements of these plans. These plans must include step-by-step procedures for preventing further escapes and for reporting escapes. These plans must be posted in a visible location at the facility and the location and contents of this plan must be well understood by all staff.

All 85 facilities inspected had developed an escape response plan. There were two sites where the plans were not posted in a visible location and one site where workers were not adequately able to address the contents of the plan.

PHOTOGRAPH #1

Escape recovery kit containing dedicated seine net and equipment to be used in the event of an escape. This net and equipment is deployed inside the containment net in an effort to prevent further loss of fish.

Another aspect of the escape response plan requires the operator to have arrangements with federal and local government authorities to obtain without delay the approvals necessary to attempt a recapture effort. To facilitate this, DFO created a special ZZA permit that is issued to fish farms and is valid to recapture escaped Atlantic salmon only. The permit is issued to the salmon farming company and is not a site specific permit. Approximately 15 companies would have been eligible for this permit in 2002. At the time of inspection no company had been issued a ZZA permit. DFO is reviewing and considering possible changes for these permits in 2003.

G. Therapeutics - Use and Record Keeping[vii]

There are specific regulatory standards for documenting use of prescription therapeutics on farmed fish. Documentation of therapeutics is an important record keeping requirement for the salmon farmer.

Records that identify treatment and treatment schedules must be kept. Finfish may not be harvested for sale after administering a drug unless the *Canadian Food and Drug Act* provides standards governing the use of the drug and the holder has complied with those standards. Alternatively, fish may be harvested if the drug has been prescribed and the mandatory period of time, as specified by the veterinarian, has passed since the administration of the drug.

To satisfy the inspection, the operator must be able to demonstrate that all appropriate paper work has been completed to document and track the administration of any therapeutics.

This includes a record and log of:

- the aquaculture licence number and name of the holder;
- the location of the facility;
- the species of finfish being cultured;
- the name of the veterinarian;
- the name of the therapeutics administered;
- how the therapeutics were administered;
- the treatment schedule including the date treatment commenced;
- the date of last treatment;
- the species of finfish; and,
- the name and signature of the person responsible for administering the therapeutics.

In the event fish have been harvested the holder must be able to produce a statement with specific information on the treatment history of the lot harvested. This statement must then accompany the fish to the processing plant. It provides the operator of the plant with documentation of any drug use and if fish have been treated, verifies compliance with the withdrawal periods.

MAFF Inspectors conducted reviews of drug record keeping requirements only at farms where fish had been medicated and where these records were available on-site for inspection. In total, 64 sites were included in the 2002 survey. The inspections revealed that 57 sites were in compliance with all drug reporting requirements. Deficiencies at the remaining 7 sites were related to log entries and failure of the company official responsible for administering the therapeutics to provide their signature as part of these records.

MAFF Inspectors encountered 7 sites where therapeutics were in use. Staff at these sites were able to demonstrate that the treatment lots could be identified, and were able to identify the therapeutics, the name of the veterinarian and the withdrawal time.

H. Net Cage Installation, Configuration, Storage and Inspection

Installation of Containment Structures:

The design of the cage support systems is important when considering the potential for snagging and tearing the containment net. Containment nets can be, and are, subjected to extreme loading, especially if they are fouled with growth, are in a high current situation or are exposed to a combination of these and other factors. The net mesh, if snagged on an anchor shackle or other catch point, cannot tolerate extreme loads and a snag can quickly develop into a significant tear under certain conditions.

All equipment that comes into contact with the containment net must have smooth exteriors designed to prevent snagging the net on rough edges that might result in tears and subsequent loss of fish. This includes both external and internal weights as well as any attachment points and other part of the infrastructure that might come into contact with the containment net. This also includes any harvesting, feeding or grading equipment that might be used on or around the site.

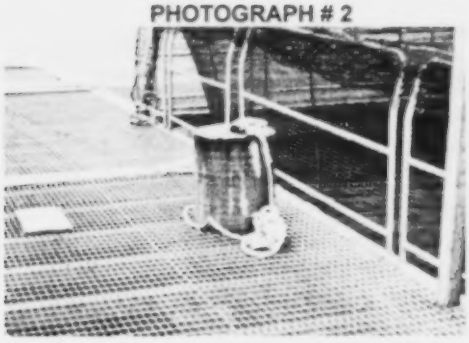
It is important for the operator to regularly review the integrity of the anchoring system. The operator must ensure that equipment is in good repair and has not been fouled with marine growth. Heavily fouled equipment creates an increased potential for snagging and tearing nets.

In investigations of incidents where fish have been lost or suspected losses have occurred, it has been found that some tears and subsequent loss of fish can be attributed to improper weighting or through contact with various components of the net weighting or system anchoring points. Industry is continually reviewing these aspects of containment structures and improvements are constant.

The above water inspections found that at 83 of the 85 sites, operators were in compliance with installation requirements and at 84 sites were properly maintaining and reviewing the net cage infrastructure.

The dive audit survey examined these features below the water and while conducted on fewer randomly selected sites, the results suggest that industry should improve maintenance of underwater attachment points. The results of the dive audit survey are summarized in a separate section of this report.

PHOTOGRAPH # 2



Typical concrete main anchor used as external weight.

Net Cage Attachment Points and Jump Nets:

The *Aquaculture Regulation* specifies that the primary point of attachment for net cages is at the water line rope. The water line rope is designed to support the heavy load of a containment net. Secured to this water line rope are numerous reinforced tie-off points that take the bulk of the strain on the nets once they are deployed. These are the primary attachment points for the containment net and are required to be secured to the walkway with lines that are sound and adequate to withstand the strain of the net. Nets should not be supported by the stanchions or uprights as these are normally not designed to withstand the load and can fail under extreme conditions.

Inspectors found that 87 percent of farms were in compliance with this requirement. The majority of the deficiencies noted in this area were usually the tie-off points in one corner of the system. Corners are often used by divers for access points to the net cage and occasionally these points may not be re-secured after a dive. Where tie-off issues were noted, these were identified as deficiencies.

Jump nets are the portions of net that extend above the water and are designed to prevent fish from jumping over the containment system. The regulation specifies the height of these jump nets must extend at least one meter above the surface of the water.

Jump nets are in place at all farms and 83 of the 85 met the minimum height requirement.

The regulation also requires that net stanchions and net cage railings are not used to moor large vessels that could cause damage during strong wind or tidal exchanges.

There were no situations where large vessels were found to be moored inappropriately.

Net Weights and Attachment Points:

The weighting system must be designed so that net weights are sufficient to prevent excess billowing of the net. It is also important to ensure that weights are evenly distributed at a sufficient number of points along the net for even weight distribution which prevents point loading on the containment net.

A taut and properly weighted net is important, as billowing nets are more subject to becoming snagged as well as more susceptible to tears or damage from predators. At 85 sites Inspectors found that no excessive billowing was occurring in the net cage systems, although at 4 sites Inspectors felt that the net weights were not evenly distributed and the operator was requested to review the weighting system.

Mesh Size:

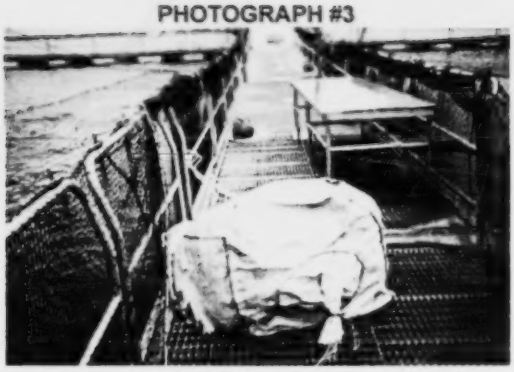
Containment nets with varying mesh are used during a grow-out period. As the fish increase in size, they are moved into bigger containment nets with larger mesh. The farm operator is required to ensure the net mesh is always kept to a size that is small enough to contain the smallest fish. Alternatively an operator may have to grade the fish prior to, or when, moving the fish into a pen with larger mesh size to avoid losing smaller fish.

No circumstances were encountered where the operator had inappropriate net sizes in place.

Net Storage:

Ultra-violet rays can degrade containment nets. Often, the weak section of the net is in an isolated location that can be easily over-looked during servicing and testing. The regulations require that storage of nets on dry land must be done in a manner that prevents exposure to UV light. Eighty three of the 85 sites were in compliance with this requirement.

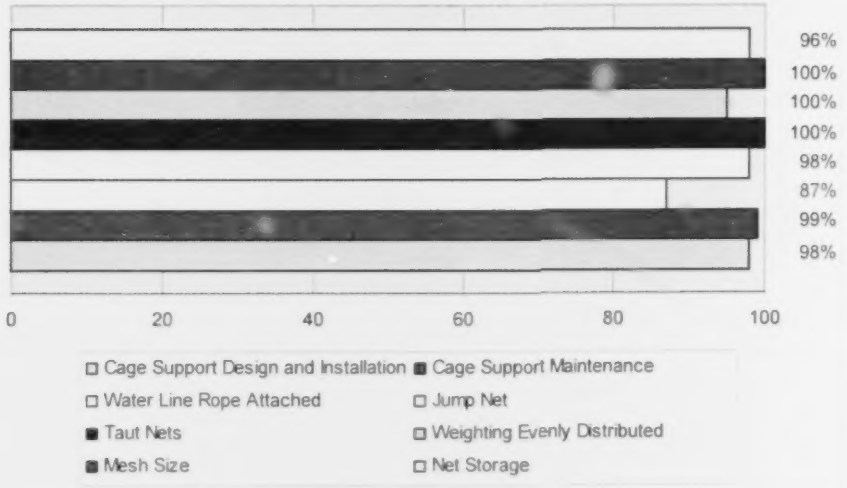
PHOTOGRAPH #3



Net properly bagged and protected from UV.

The following, graph 5, provides compliance rates to the various requirements for net cage installation, configuration, storage and inspection as described in the above section.

GRAPH 5
COMPLIANCE WITH NET CAGE INSTALLATION, CONFIGURATION AND STORAGE



I. Net Cage Inspections

During the 2002 inspection cycle at the 85 operating sites, there were close to 1000 deployed net pens containing fish.

The integrity of these containment nets is an important factor in salmon farming. Nets must be able to withstand the rigours of the marine environment and weak nets are more susceptible to breakage and subsequent loss of fish. The *Aquaculture Regulation* specifies that all containment nets must be properly tagged, maintained and regularly inspected.

One of the more significant 2002 amendments to the *Aquaculture Regulation* provides the Inspector with the ability to address situations where the condition of any net is in question. If an Inspector has reason to doubt the integrity of a containment net, in addition to reviewing service records, they can require the salmon farmer to conduct an on-site test of the net or can require that the net be removed from the water for a complete servicing and inspection.

No additional inspections or actions were requested by the Inspectors under this section in 2002.

Net Marking:

To effectively document and maintain net history, the regulation requires that each net must be marked in a unique and permanent manner. In most cases, this consisted of a coded tag that was attached to one or more of the upper corners of the net cage.

Containment nets must be properly identified to ensure that the operator can maintain a complete history of the net. In the event of an incident, net records are a key component of the investigation and complete records must be provided to the Inspector upon request. Inspectors found that 80 of the 85 farms sites inspected met this requirement.

Out-of-Water Servicing:

The April 2002 amendments to the *Aquaculture Regulation* removed the requirement that specified containment nets had to undergo a complete out of water servicing every 18 months. The frequency of testing is now left up to operators providing them flexibility to meet operational needs.

Inspectors, however, now have the authority to require an operator to demonstrate that a net cage meets the minimum breaking strengths. This may mean the operator will be requested to conduct an on-site strength test of the net or in some cases the holder may have to remove the net cage for a complete out of water servicing and inspection at the request of the Inspector.

In general, companies are now servicing and strength testing their nets at the end of a grow-out period.

The out-of-water servicing includes net strength testing, assessment of overall condition and any necessary repairs. A record of the testing must be completed and this record must accompany the net to the farm site and be presented upon request to the Inspector as the most recent out-of-water servicing record. [viii]

Operators at 70 out of 85 farms sites had the required out-of-water servicing records on site.

Net strength testing and record keeping requirements were areas in the 2002 regulation that underwent extensive revision. As a result of these new requirements, it was expected that companies would need some time to comply with the new testing and documentation requirements, especially considering many nets were currently in use and the fish were part way through a grow out cycle. It is expected however, that any net being newly deployed to hold fish or replace an existing net will fully meet the new requirements.

Section 14 and 15 and Tables 1 through 6, in *Appendix 2* of the *Aquaculture Regulation*, found as ***Appendix 5***, describes the minimum breaking strength requirement that various size containment nets must meet.

Any nets that do not meet these requirements are inadequate and they cannot be re-deployed as containment nets. These nets should either be disposed of or relegated to other purposes. ***Appendix 4*** describes the standardized net cage mesh strength testing procedure.

Net Inspections and Repairs:

The *Aquaculture Regulation* specifies that daily above-water inspections of net cages are required to ensure integrity of the system. This information must be maintained in the daily maintenance logs.

Daily above water checks were being conducted at all 85 sites.

Deployment of a containment net is a high risk activity. Before the net is properly stabilized there is an increased risk that the net may catch and tear on a snag point. The *Aquaculture Regulation* requires that once a containment net is in place and prior to the introduction of fish, and in addition to any above water inspections, an underwater inspection must also be made to check the net to ensure that no damage to the net has occurred during the net deployment that might contribute to a fish escape.

Inspectors determined that 82 out of 85 sites were conducting pre-inspections prior to the entry of fish.

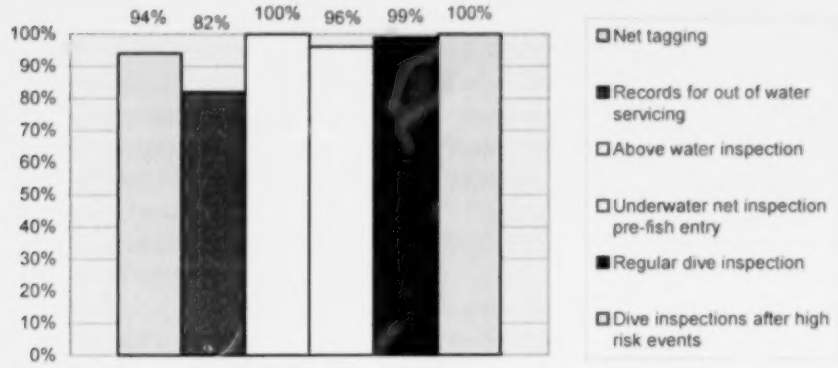
The *Aquaculture Regulation* requires that underwater inspections of containment nets be completed every sixty days or after any activity that may increase the risk of net failure and present a risk of escape. Examples of this would include extreme environmental conditions, net cage changes, fish delivery, predator attacks, towing net cages and vandalism.

The *Aquaculture Regulation* currently specifies that these under-water inspections be conducted by divers but also provides the opportunity for flexibility in the event that an alternative suitable method is proposed. Any proposed method will have to be reviewed and approved by MAFF before it can be used. In 2002, all underwater inspections were conducted by divers.

Regular underwater inspections were being conducted at 84 of the 85 sites inspected. At all sites inspected, underwater checks were being conducted after high risk activities and operators at 82 out of 85 sites were documenting these underwater inspections as required.

The following graph illustrates the compliance rates with various net maintenance and inspection requirements. It includes compliance with net tagging, records kept on site for the last out of water servicing, any above water inspections, pre-inspection before the entry of fish, correct mesh size and regular underwater inspections

GRAPH 6
COMPLIANCE WITH TAGGING, SERVICING & NET INSPECTION REQUIREMENTS



J. Boat Docking

To reduce or eliminate potential damage to net cages from vessels travelling to and from farms, a specific docking site for vessels must be identified on the farm site. The regulation requires this docking site to be designed or located in a manner to prevent propeller damage to the cage systems and must be marked with a highly visible sign.

At the 85 sites inspected, 83 had designated docking areas, 64 were properly signed and 84 were designed to prevent net damage.

PHOTOGRAPH #4

Properly designated and signed vessel docking area.

K. Fish Handling

Catch nets:

The *Aquaculture Regulation* requires the use of catch nets when operators are conducting higher risk activities such as transporting, harvesting, grading, sampling and or moving fish. Catch nets act as a back-up and help prevent possible loss in the event of human error or equipment failure.

All sites inspected either had equipment on-site or verified that catch nets were used during higher risk activities.

Spotters:

Another preventative measure that the *Aquaculture Regulation* requires is the use of spotters during high risk activities. A spotter is a farm employee who has been assigned the specific task of visually watching for any event during a high risk activity that might in, any way, contribute to an escape of fish. Ideally, spotters should be experienced farm employees that are familiar with the operation in progress and should not be engaged in other activities at the time. Depending on the event, it may be appropriate to have one or more individuals acting as spotters.

At 84 of the farm sites inspected operators indicated spotters were used during high risk activities.

Predator Control:

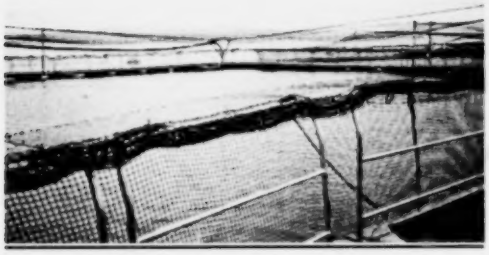
Although the *Aquaculture Regulation* does not specify that salmon farm operators must deploy predator controls it is expected that farm operators will initiate measures against predator attacks where necessary.

The *Aquaculture Regulation* requires that if a pattern of predator attacks is established, holders must initiate measures to prevent net damage and loss of fish. Failure to comply with these requirements could be viewed as failure to take reasonable measures to prevent an escape.

Most farm sites inspected had some measure of predator deterrent in place. In some cases, two or more systems were in place. Common types of predator systems include predator nets, shark guards, and bird exclusion netting above water.

No violations were noted with respect to predator control.

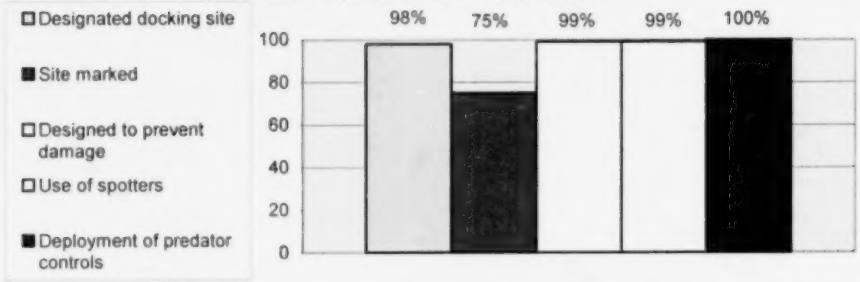
PHOTOGRAPH #5



Bird netting as predator control.

The following graph indicates compliance with boat docking requirements, use of spotters and predator control.

GRAPH 7
COMPLIANCE WITH DOCKING, SPOTTING AND PREDATOR CONTROLLING



D. COMPLIANCE RATES – REGULATORY AND LICENSING REQUIREMENTS

PART #2

MWLAP REQUIREMENTS

Best Management Practices Plan

As noted previously, all farm sites as of March, 2003 require a Best Management Practices Plan in accordance with the provisions of the *Finfish Aquaculture Waste Control Regulation*. A number of the topics discussed below are now required to be addressed within the plan. A graph showing the compliance rates to the various MWLAP requirements can be found at the end of this part.

A. Blood Water Disposal

In an effort to maintain the high quality of farmed salmon, salmon farmers rely on two methods to deliver their fish to the processing facility in prime condition. One is using a live haul vessel where the fish are harvested and delivered live, while the other is a stunning and bleeding operation carried out either on site or during delivery. Intentional discharge of untreated blood water to the environment is not permitted.

Blood water associated with the stunning and bleeding operation has a very high biochemical oxygen demand (BOD), and can negatively impact dissolved oxygen levels in the marine environment. It has been suggested that the release of blood water to the environment may also result in disease transmission. Predators may also be attracted by released blood water.

Of the 24 sites inspected, seven operators relied on stunning and bleeding while at the remaining sites fish delivery depended on live transport.

Disposal methods for the blood water included transfer into mort containers, or transport and disposal of blood water at a processing facility.

No deficiencies were noted at the seven sites where fish were being stunned and bled just prior to or during delivery.

B. Net Cleaning Waste Disposal

Net Treatment:

Predator and containment nets may be chemically treated in order to increase their longevity and strength, as well as to reduce fouling by marine plants and organisms. Typically, treatment consists of dipping the containment net into an approved antifoulant solution that inhibits marine growth.

Net Cleaning:

The frequency of net cleaning is largely dependent on the degree and condition of antifoulant treatment as well as the environmental conditions at the grow out site where the nets are deployed.

Typically, nets are cleaned at least once a year. The cleaning process is necessary to allow unrestricted flow of water through the net cage as well as to reduce the weight and resulting strain on the net cage and support equipment. Cleaning the nets removes mussels, algae, and other materials that have fouled the nets and in the case of treated nets will also remove some of the antifoulant during the cleaning process.

The wastewater and debris generated through the net cleaning process may have a negative impact on oxygen levels in the marine environment and the benthic community.

Net cleaning is conducted both on and off site with the resulting waste discharged on land or into the marine environment.

Of the 24 salmon farms inspected, the majority of the operators cleaned at their net loft facilities.

There was one non-compliance issued identified at a site where net cleaning took place on-site and the waste generated from the cleaning was not properly managed.

PHOTOGRAPH #6

On-site net cleaning drum system.

C. Footbath Waste Disposal

Footbath disinfectants are utilized at farm sites to minimize the transfer of disease from farm to farm, as well as disease transfer within a farm. Commonly used footbath solutions are virkon, ovadine and bleach. Over time, especially when exposed to sunlight, the disinfectant's effectiveness lessens and it becomes necessary to periodically refresh footbaths. Depending on the solution used, the period of time between refreshing the foot baths varies but generally most footbaths are replaced on a weekly basis.

In order to safely manage the disposal of used liquids, footbath materials must not be capable of causing harm or injury to plant or animal life-forms in the marine environment. Any discharge or storage must meet the requirements of the *Waste Management Act*.

Discharging the footbath waste into septic tanks and mort containers prevents direct discharge into the environment; however, these practices may have a negative impact on the septic tank operation, or the mort composting process.

All 24 farms inspected had foot baths on-site. At the majority of these sites, the disinfectants were disposed of directly into the mort containers. In some cases, treatment of the disinfectants was practiced prior to discharge.

Inspectors found 23 of 24 sites were in compliance with the handling and disposal of these disinfectants used on the farm site.

D. Mort Disposal

Fish mortalities, or morts, are fish that have died prior to harvest due to a number of reasons including stress, plankton blooms, predator strikes or disease. Due to the high number of fish raised at fish farms, morts are anticipated and regularly encountered. It is important not only from a health perspective to remove morts on a regular basis but it is also important from a predator avoidance perspective. Mortalities left in the net cages can attract predators that may in turn damage nets in their attempt to access the morts.

For these reasons it is important that the farm operator implement a regular mort collection program. At all the farms inspected, the mortalities were collected on a regular basis by divers.

Morts were stored on-site in sealed containers some distance from the grow-out operation and remained there until final collection for disposal. Collection times varied from weekly to every three months or in some cases, as required.

At all farms inspected, the morts collected were delivered to disposal companies off-site.

There were no compliance issues identified with mort containment and disposal requirements.

E. Refuse Disposal

Operators at the farms inspected removed domestic or industrial refuse produced on-site for disposal at one of the approved landfills on Vancouver Island or the Lower Mainland.

There were no compliance issues identified with refuse storage and disposal requirements at the farms inspected.

F. Sewage Treatment and Disposal

The majority of fish farms have living quarters on site, and collect, treat and discharge sewage at or near the farm location. Untreated sewage has elevated biochemical oxygen demand which may negatively impact the environment and fish. This waste also contains solids that may be deposited on the ocean floor.

Inspectors found that 22 of the 24 sites inspected, had property treated sewage prior to disposal and 22 of 24 sites were properly discharging sewage.

Effective March 2003, farms operators are required to comply with new regulatory requirements for sewage treatment and disposal. Section 7 of the *Finfish Aquaculture Waste Control Regulation* establishes standards for the discharge of domestic sewage. The *Finfish Aquaculture Waste Control Regulation* can be found in ***Appendix 13***.

G. Water Licensing

Fish farms that use freshwater from a lake, river or stream are required to hold an authorization issued pursuant to the *Water Act*.

Many of the salmon farms inspected obtained their domestic water supply from a variety of sources. These included rain water, water from lakes or streams, well water and water transported to the site. Some operations relied on a combination of these sources.

Eleven of the farms inspected either used stream water exclusively for their domestic water supply or relied upon a combination of stream water and other sources. Operators at six of these sites were not in compliance with water licensing requirements.

H. Wildlife Trapping - Predator Prevention and Response

Predators such as seals, sea lions and dogfish can cause significant tears in the containment nets and have been suspected as the primary cause for a number of escapes. It is the responsibility of the farmer to ensure that protective measures are implemented to prevent predator attacks.

If a farmer did not take appropriate measures against increased predator attacks, this could be construed as not taking reasonable precautions to prevent escapes, an offence under the *Aquaculture Regulation*.

Typically, salmon farm operators will use non-lethal methods to control predators at the farm site. These include the use of predator nets, shark guards, bird netting, electric fences and ensuring nets are kept taut. Despite these precautions, persistent predators may have to occasionally be destroyed. This is accomplished either through trapping or with a firearm.

Hunting and trapping is carefully regulated under the *Wildlife Act*. None of the operators at the 24 farm sites inspected reported wildlife being trapped in the last year. At two sites firearms were present but were not associated with predator kills.

No violations were noted at the inspected sites.

I. Fuel Product Use, Storage and Containment

Storage of fuels is common at salmon farms as fossil fuels are widely used to run generators for electricity, boat engines and heat. The *BC Fire Code* requires that a spill containment barrier capable of containing 110% of the volume of the fuel being stored, or another adequate form must be in place.

Operators at 21 of the 24 sites had taken measures to ensure that secondary containment systems were installed around fuel storage containers and generators to meet the 110% percent requirement.

PHOTOGRAPH #7

Diesel fuel with 110% containment (double walled) and protection from precipitation.

PHOTOGRAPH #8

Gasoline containment and protection from precipitation

J. Environmental Management Practices

Many farm sites store a variety of petroleum products, chemicals and other products that if released into the surrounding environment could potentially have a negative impact. In an effort to minimize the severity of any spill most companies have developed spill contingency plans and have adequate equipment that would assist in managing any accidental spill.

All 24 sites inspected had a spill contingency plan with equipment on-site to support the plan.

PHOTOGRAPH #9

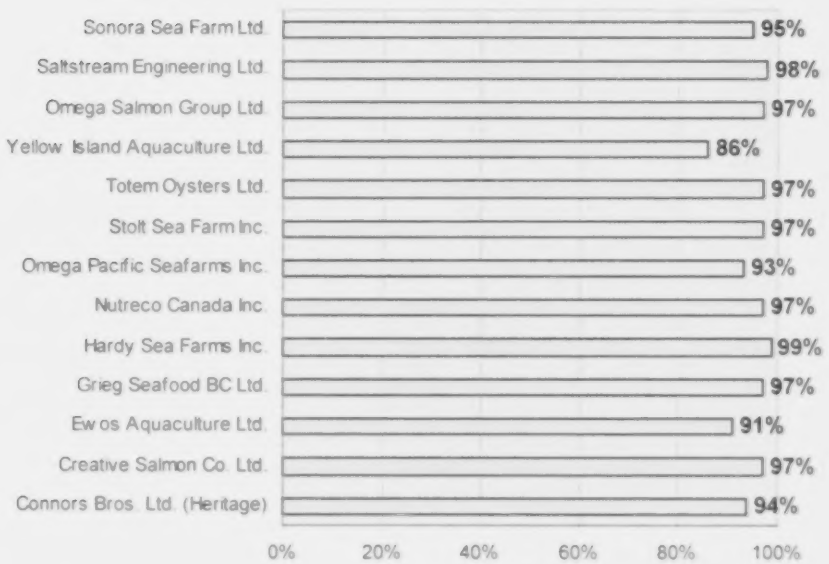
On-site spill kit and cleanup equipment.

E. 2002 COMPLIANCE RATE SUMMARY

Graphs 8 and 9 illustrate the overall percentage of compliance rates with the regulatory requirements reviewed during the inspections. The percentage calculations were derived by factoring the number of compliance issues examined at each site, the number of sites and the actual number of violations noted.

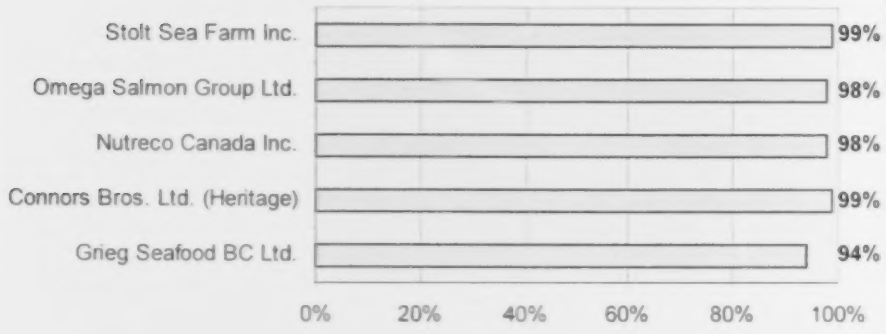
Graph 8 illustrates compliance with MAFF legislative and regulatory requirements in the BC *Fisheries Act* and *Aquaculture Regulation*.

GRAPH 8
MAFF COMPLIANCE RATE PER COMPANY



Graph 9 indicates compliance rates with MWLAP requirements observed during inspections.

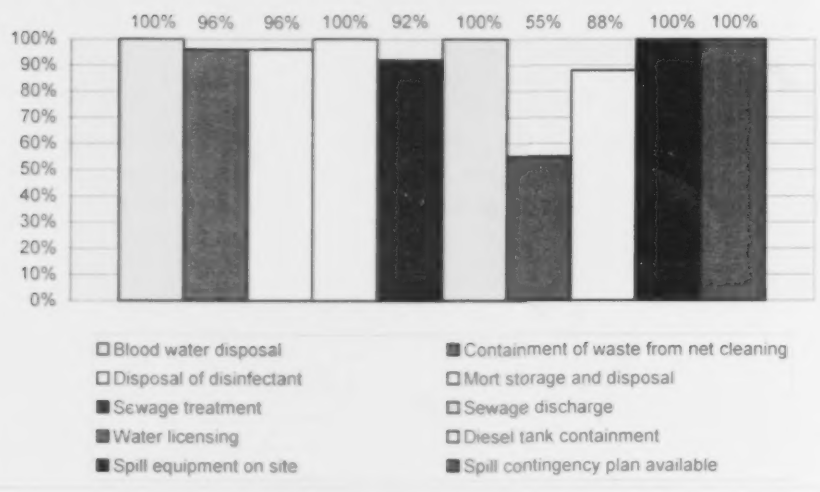
GRAPH 9
MWLAP COMPLIANCE RATE PER COMPANY



Note: Due to the limited number of companies reviewed for MWLAP regulatory requirements, these compliance rates should not be used to make assumptions about overall industry compliance.

The following graph illustrated the percent compliance levels with the MWLAP based inspections.

GRAPH 10
COMPLIANCE LEVELS FOR MWLAP BASED INSPECTIONS



F. 2002 COMPLIANCE NUMBERS – SITES IN COMPLIANCE

MAFF REQUIREMENTS

Table 1 provides a detailed summary of issues examined and the number of sites found in compliance during the 2002 inspection cycle. ***Appendix 11*** provides a comprehensive report of the deficiencies noted for each company at each of their operating sites inspected in 2002.

The following information is based on the annual above-water inspections and does not include any non-compliance issues that may have been identified during the dive audit program.

Information and findings of the dive audit program are provided later in this report.

More detailed explanation on those areas examined follow in the next section of this report.

TABLE #1:

MAFF Compliance Issue Assessed On Site	Sites in Compliance (of 85 inspected)
Management Plan Compliance to Aquaculture Licence:	
• Approved species on site	85 of 85
• Current Licence	84 of 85
• Biomass requirements[ix]	64 of 85
• Site Configuration (Number and size of nets and their deployment)	20 of 85
Inventory Records:	
• Transport, transfer and introduction of fish	84 of 85
• Maintenance of mortality records	83 of 85
• Maintenance of stock source identity records	85 of 85
• Record of fish sales	85 of 85
• Required records on site	82 of 85

MAFF Compliance Issue Assessed On Site	Sites in Compliance (of 85 inspected)
Inspection Records:	
• Records kept of daily visual inspections	83 of 85
• Records kept of all net cage inspections by divers	82 of 85
• Records of inspections kept after high risk activities or events including extreme environmental conditions, net cage changes, fish delivery, recurring predator attacks, vandalism, and towing	85 of 85
• Net cage records kept that include:	
Inventory control number	82 of 85
Dimensions	83 of 85
Mesh size	83 of 85
Records of most recent out of water servicing	70 of 85
Records of accumulated time in the water	82 of 85
Description and date of each underwater inspection	83 of 85
Description, dates and reasons for all repairs	83 of 85
• Net cage maintenance records kept on site	73 of 85
Escape Response:	
• Written escape response plan	85 of 85
• Escape plan posted	83 of 85
• Staff familiar with the plan	84 of 85
• Inclusion of step by step procedures	85 of 85
• Arrangements in place for recapture permits[x]	**See footnote**
Therapeutant use and Records:	
• Current treatment – groups identified	7 of 7
• Current treatment therapeutant, prescribing vet and withdrawal time identified	7 of 7
• Records kept – licence number and holder	63 of 64
• Records kept – location of facility	64 of 64
• Records kept – species of finfish	64 of 64
• Records kept - vet name	64 of 64
• Log of drug records	58 of 64

MAFF Compliance Issue Assessed On Site	Sites in Compliance (of 85 inspected)
Installation of Containment Structures:	
• Cage support equipment design and installation	83 of 85
• Cage support equipment maintained	84 of 85
Net Cage Configuration:	
• Water line rope primary attachment point	74 of 85
• Jump net extends at least 1 meter	83 of 85
• Sufficient weight or pressure for taut net	85 of 85
• Net cage weights distributed sufficient points	81 of 85
• Net mesh small enough to contain smallest fish	85 of 85
• Proper storage of nets	83 of 85
Net Cage Inspections:	
• Net tears immediately repaired	85 of 85
• Daily above water visual inspections completed	85 of 85
• Underwater inspections completed every 60 days	84 of 85
• Underwater inspections done before fish entry	82 of 85
• Nets permanently marked with inventory number	80 of 85
Containment structures inspected after:	
• High risk activities that include extreme environmental conditions, net cage changes, fish delivery, recurring predator attacks, vandalism, towing of active structures	85 of 85
Boat Docking:	
• Designated area to dock boats	83 of 85
• Signs posted to direct boats to designated docking area	64 of 85
	84 of 85
• Dock sites designed to prevent net damage	85 of 85
• Large vessels not moored to cage support systems	
Fish Handling:	
• Use of spotters	84 of 85
• Use of catch nets	85 of 85
Predator Control:	
• Implemented measures to address any increase in predator attacks	85 of 85

F. MWLAP REQUIREMENTS

The following table provides a detailed summary of issues examined and number of sites found in compliance during the 2002 inspection cycle.

More detailed explanation on those areas examined follow in the next section of this report.

TABLE #2:

MWLAP Compliance Issue Assessed On Site	Sites in Compliance 24 sites inspected
Blood Water Disposal:[xi]	
• Blood water properly disposed	7 of 7
Net Cleaning and Waste Disposal:	
• Proper containment of waste generated from net cleaning	23 of 24
Disinfectant Use and Disposal:	
• Proper disposal of disinfectants	23 of 24
Mort Storage and Disposal:	
• Morts properly contained without spillage	24 of 24
• Morts properly disposed	24 of 24
Refuse Storage and Disposal:	
• Refuse properly stored on site	24 of 24
• Refuse properly disposed	24 of 24
Sewage Treatment and Disposal:	
• Domestic sewage properly treated prior to disposal	22 of 24
• Sewage discharged properly	22 of 24
Water Use and Licensing:	
• Approved use of water[xii]	6 of 11
Wildlife Predator Trapping:[xiii]	
• Predator trapping done with appropriate permits	**See footnote**
Firearms on site for Personal Use or Hunting:[xiv]	
• Firearms on site	**See footnote**
Fuel Product Use, Storage and Containment:	
• Diesel tanks protected with 110% containment	21 of 24
• Proper storage of fuels, therapeutants and anesthetics	24 of 24
Environmental Management:	
• Adequate spill equipment on site	24 of 24
• Spill contingency plan available	24 of 24

6. OTHER 2002 COMPLIANCE AND ENFORCEMENT ACTIVITIES

A. PRE-INSPECTIONS FOR NEW APPLICATIONS AND RELOCATIONS

As noted earlier, a number of salmon farming sites were considered for relocation in 2002 as recommended by the Salmon Aquaculture Review.

When the licensing authority approves a new licence application, such as for a relocation, a condition of licence prior to any introduction of fish is a satisfactory pre-start up inspection by a MAFF Inspector to ensure compliance with all regulatory and licence requirements. This includes a review of all components identified in the applicant's management plan, compliance with legislative and regulatory requirements and verification that the company has met all general licence terms and conditions and any additional conditions that may have been added.

A satisfactory pre-inspection by MAFF Inspection staff will likely be adopted as a required condition of any new Aquaculture Licence prior to commencement of operations.

B. DIVE AUDIT PROGRAM

MAFF conducted the second round of dive audits in 2002. Between February and May of 2002, dive audits were completed at six operating farm sites. These dive audits are site specific and unannounced.

The purpose of the unannounced dive audit is to assess underwater farm features and ensure that the operator is in compliance with regulatory requirements and properly managing the underwater maintenance of the containment nets, anchoring systems and other supporting infrastructure.

Experienced dive teams attend a site with a MAFF inspection team, spending approximately one day at each selected site, videotaping and examining various farm features below water. Aspects examined include condition of net pens and their repairs, anchoring systems, net weight design and installation, condition of lines and associated hardware and other below-surface features.

The Inspector reviews the findings and a report with video is forwarded to the company for discussion and follow up. Of the six sites selected in 2002, two were located in the Broughton Archipelago, two in Clayoquot Sound and two in the Quadra Island/Campbell River area. Photographs from the dive audits are included in this section of the report.

The following table identifies the company, sites and dive locations of the 2002 dive audit program:

TABLE #3

Company Name	MAFF REF#	Area	Site Name	Date Audited
Ewos Aquaculture Ltd.	1472	Clayoquot	Westside	May 7, 2002
Connors Bros. Ltd. (Heritage)	819	Broughton	Cecil Island	March 28, 2002
Connors Bros. Ltd. (Heritage)	1336	Broughton	Mt. Simmons Bay	March 27, 2002
Creative Salmon Co. Ltd.	776	Clayoquot	Baxter Islet	March 20, 2002
Nutreco Canada Inc. (Marine Harvest)	733	Quadra Island	Cyrus Rocks	February 22, 2002
Connors Bros. Ltd. (Heritage)	306	Quadra Island	Venture Point	February 20, 2002

Issues identified during these dive audits included:

1) Net tension was an issue in some cases. Excessive billowing can be a concern as it creates more potential for net snag and subsequent tearing. A review of the net weighting systems was recommended at five of the sites inspected.

2) Potential snag points were identified at 5 of the sites inspected. Issues identified varied and included unused hardware remaining on the main anchors, exposed shackle pins, rough edges from concrete weights, and use of sharp rocks as net weights in plastic bags.

3) One site had an excessive build-up of debris that had caused some damage in one of the transfer nets on-site.

4) Five sites had holes in the predator netting that required repair.

5) At three sites company officials were asked to review the quality of net repairs that had been performed on site.

6) At three sites the predator net was deemed likely ineffective due to the weighting system used.

7) At one site marine growth had built up on supporting framework for the containment structures and was causing some abrasion on the predator nets.

Where deficiencies were noted, farm site operators were given 30 days to notify MAFF in writing that corrective measures had been implemented.

DIVE AUDIT PHOTOGRAPHS

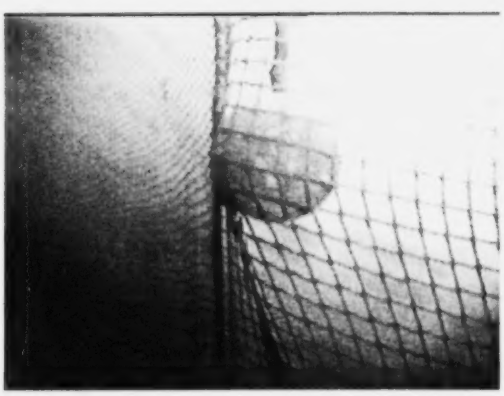
77 litre garbage can external weight checked for potential entanglement or chafing points.

Central external weight with tie-down lines going to four net pens.

Typical hole repaired at net loft.

Main support line running up to the cage system.

Typical rigging of external weights. Checked for wear at points where rope is pinched by the chain and shackle.



25 pound lead internal net weight checked for wear against net.

C. ENVIRONMENTAL MONITORING

During 2002, MWLAP conducted chemical sampling of bottom sediments at some farm sites. Sediment samples were collected at some farm sites and the benthic organisms contained within the sediment samples are being taxonomically classified. Results of the sediment sampling will be released upon completion of the analysis.

Sediment samples were collected at the following farm sites:

TABLE #4

Company	MAFF REF#	Farm Site	General Area
Heritage Salmon Ltd.	458	Cypress Harbour	Broughton Archipelago
Heritage Salmon Ltd.	728	Sir Edmund Bay	Broughton Archipelago
Nutreco Canada Inc.	112	Centre Cove	Kyuquot Sound
Nutreco Canada Inc.	733	Cyrus Rocks	Campbell River
Nutreco Canada Inc.	1158	Hohoae Island	Kyuquot Sound
Nutreco Canada Inc.	108	Orchard Bay	Campbell River
Omega Salmon Group Ltd.	1621	Kent Island	Queen Charlotte Sound
Omega Salmon Group Ltd.	1198	Raynor G.	Queen Charlotte Sound
Omega Salmon Group Ltd.	1136	Shaw Pt.	Queen Campbell Sound
Ewos Site Co. Ltd.	227	Bawden Pt.	Clayoquot Sound
Ewos Aquaculture Ltd.	526	Rant Pt.	Clayoquot Sound
Ewos Aquaculture Ltd.	314	Ross Pass	Clayoquot Sound
Ewos Aquaculture Ltd.	1472	Westside	Clayoquot Sound
Stolt Sea Farm Inc.	466	Arrow Pass	Broughton Archipelago
Stolt Sea Farm Inc.	143	Larsen Island	Broughton Archipelago
Stolt Sea Farm Inc.	467	Midsummer Island	Broughton Archipelago
Stolt Sea Farm Inc.	465	Swanson Island	Broughton Archipelago
Stolt Sea Farm Inc.	739	Upper Retreat	Broughton Archipelago

For 2003, MWLAP is continuing to conduct chemical and sediment sampling at a number of farm sites as part of its compliance program. It will also collect more scientific information to evaluate the effectiveness of the environmental protection standards.

D. BRANCH INVESTIGATIONS

Under provincial legislation, MAFF Inspectors or MWLAP Conservation Officers have six months from the date of the event to investigate and, if appropriate, pursue enforcement sanctions. Investigations are considered highly confidential until concluded.

Results of investigations may lead to one or more of the following outcomes:

- determination that the incident (i.e., escape) or possible violation does not warrant any enforcement sanction;
- issuance of a written warning;
- issuance of one or more violation tickets;
- submission of a report to Crown Counsel with recommended charges; or,
- recommendation to the licensing authority for aquaculture licence suspension or revocation.

From January 2002 to December 2002, MAFF Fisheries Inspectors initiated a total of 139 investigations of possible non-compliance with the BC *Fisheries Act* or *Aquaculture Regulation*. Of these files, 18 have been referred to MWLAP for formal investigation.

Statistics on numbers of investigation are as follows:

E. INVESTIGATIONS

- 63 percent of the cases pertain to alleged finfish aquaculture violations including escape incidents;
- 13 percent of the cases pertain to alleged shellfish aquaculture violations;
- 24 percent of the cases pertain to violations in respect of non-aquaculture activities such as commercial fish licensing and marine plant harvesting.

Status of 2002 Investigations:

The following tables show the results of completed aquaculture finfish investigations in 2002.

The following table shows companies that have been issued violation tickets or warnings for non-compliance by MAFF Inspectors and where the tickets have been paid without dispute for 2002.

TABLE #5:

Company	Act or Regulation	Violation Date	Sanction	Penalty
Omega Salmon Group Ltd.	Fisheries Act Section 25 (2) (Contravened provisions, conditions or regulations)	June 18, 2002	Violation Ticket	$115.00
Omega Salmon Group Ltd.	Fisheries Act Section 25 (2) (Contravened provisions, conditions or regulations)	June 17, 2002	Violation Ticket	$115.00
Omega Salmon Group Ltd.	Fisheries Act Section 25 (2) (Contravened provisions, conditions or regulations)	June 18, 2002	Violation Ticket	$115.00
Omega Salmon Group Ltd.	Fisheries Act Section 25 (2) (Contravened provisions, conditions or regulations)	June 18, 2002	Violation Ticket	$115.00
Omega Salmon Group Ltd.	Fisheries Act Section 25 (2) (Contravened provisions, conditions or regulations)	June 17, 2002	Violation Ticket	$115.00
Ewos Aquaculture Ltd	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	n/a	Warning Letter	n/a
Ewos Aquaculture Ltd	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	n/a	Warning Letter	n/a
Ewos Aquaculture Ltd	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	n/a	Warning Letter	n/a
Ewos Aquaculture Ltd	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	n/a	Warning Letter	n/a
Ewos Aquaculture Ltd	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	n/a	Warning Letter	n/a
Ewos Aquaculture Ltd	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	n/a	Warning Letter	n/a
Omega Pacific Seafarms Inc.	Aquaculture Regulation Section 4 (1) and (2), also Aquaculture Regulation Section 19 (2) (Failure to report an escape, also failure to complete inspections and repairs)	n/a	Warning Letter	n/a
Nutreco Canada Inc.	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	April 10, 2002	Violation Ticket	$173.00
Nutreco Canada Inc.	Aquaculture Regulation Section 7 (2) (Failure to take reasonable precautions to prevent an escape)	April 10, 2002	Violation Ticket	$115.00
Creative Salmon Co. Ltd	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	n/a	Warning Letter	n/a
Connors Bros. Ltd. (Wehlis Bay)	Fisheries Act Section 25 (5) (b) (Failure to comply with condition of licence)	August 26, 2002	Warning Ticket	n/a
Connors Bros. Ltd. (Mt. Simmonds Bay)	Fisheries Act Section 25 (5) (b) (Failure to comply with condition of licence)	August 26, 2002	Warning Ticket	n/a
Connors Bros. Ltd. (Sir Edmund Bay)	Fisheries Act Section 25 (5) (b) (Failure to comply with condition of licence)	September 12, 2002	Warning Ticket	n/a
Connors Bros. Ltd. (Burdwood Group)	Fisheries Act Section 25 (5) (b) (Failure to comply with condition of licence)	September 12, 2002	Warning Ticket	n/a
Connors Bros. Ltd. (Cypress Harbour)	Fisheries Act Section 25 (5) (b) (Failure to comply with condition of licence)	September 12, 2002	Warning Ticket	n/a
Connors Bros. Ltd. (Maude Island)	Fisheries Act Section 25 (5) (b) (Failure to comply with condition of licence)	September 12, 2002	Warning Ticket	n/a
Connors Bros. Ltd. (Cecil Island)	Fisheries Act Section 25 (5) (b) (Failure to comply with condition of licence)	September 12, 2002	Warning Ticket	n/a

The following table shows investigations completed by MAFF that resulted in recommended charges to Crown. The table highlights the results of the court imposed fines.

TABLE #6:

COMPANY NAME	ACT OR REGULATION CONTREVENED	DISPOSITION/SANCTION
Omega Salmon Group Ltd.	Aquaculture Regulation Section 7(2) (Failure to take reasonable precautions to prevent an escape) Aquaculture Regulation Section 8(1) (Failure to keep drug records)	Port Hardy, November 5, 2002. Guilty pleas entered. $1000 fine for each count.
Fortune Channel Farm Ltd. Pacific National Aquaculture Ewos Canada Ltd.	Aquaculture Regulation Section 8(1) (Failure to keep drug records) Aquaculture Regulation Section 7(2) (Failure to take reasonable precautions to prevent an escape)	Tofino, January 6, 2003. Guilty pleas entered. $250 fine on each count.
Orca Bay Shipping Inc.	Aquaculture Regulation Section 12 Fisheries Act Section 25(2) (Contravened provisions, conditions or regulations)	November 5, 2001. Found guilty. $1000 fine.
Pacific National Group Ent. Ltd. Ewos Aquaculture Ltd. Ewos Canada Ltd.	Aquaculture Regulation Section 7(2) (Failure to take reasonable precautions to prevent an escape)	Tofino, January 6, 2003. Guilty plea entered. $1000 fine.
Pacific National Group Ent. Ltd. Ewos Aquaculture Ltd. Ewos Canada Ltd. Pacific National Aquaculture	Aquaculture Regulation Section 7(2) (Failure to take reasonable precautions to prevent an escape) Aquaculture Regulation Section 8(1) (Failure to keep drug records)	Tofino, January 6, 2003. Guilty plea entered to count 2. $250 fine. Crown directed stay of proceedings on Count 1.
Fortune Channel Farm Ltd. Pacific National Aquaculture Ltd. Ewos Canada Ltd.	Aquaculture Regulation Section 8(1) (Failure to keep drug records)	Tofino, January 6, 2003. Guilty plea entered. $250 fine.
Fortune Channel Farm Ltd.	Fisheries Act Section 25(2) (Contravened provisions, conditions or regulations)	Tofino, January 6, 2003. Guilty plea entered. $115 fine.
Ewos Site Company Ltd.	Fisheries Act Section 25(2) (Contravened provisions, conditions or regulations)	Tofino, January 6, 2003. Guilty plea entered. $115 fine.
Ewos Site Company Ltd.	Fisheries Act Section 25(2) (Contravened provisions, conditions or regulations)	Tofino, January 6, 2003. Guilty plea entered. $115 fine.
Ewos Aquaculture Ltd Pacific National Group Ent. Ltd. Ewos Canada Ltd.	Aquaculture Regulation Section 7(2) (Failure to take reasonable precautions to prevent an escape)	Tofino, January 6, 2003. Guilty plea entered. $250 fine.
Ewos Aquaculture Ltd.	Fisheries Act Section 25(2) (Contravened provisions, conditions or regulations)	Tofino, January 6, 2003. Guilty plea entered. $115 fine.
Ewos Aquaculture Ltd Pacific National Group Ent. Ltd.	Fisheries Act Section 25(2) (Contravened provisions, conditions or regulations)	Tofiino, May 5, 2003. Guilty plea entered. $400 fine.
Omega Salmon Group Ltd.	Fisheries Act Section 13 (5) (Operating a facility without a licence)	Port Hardy, August 15, 2003. Guilty plea entered. $5500 fine.

These investigations and subsequent convictions were initiated prior to the inception of the Service Agreement with MWLAP. They do not reflect any file referrals (18 to March 2003) made by MAFF inspection staff to MWLAP pursuant to our new agreement.

These files also do not pertain to any open investigations currently being conducted by MAFF or WLAP compliance and enforcement staff.

7. CONCLUSION

During the 2002 inspection cycle, Inspectors in general found acceptable levels of compliance to most of the regulatory requirements that deal with record keeping, net cage and containment inspections, equipment maintenance and other practices as defined in Appendix 2 of the *Aquaculture Regulation*.

The one area of concern remains the continued level of non-compliance with site specific management plans.

Overall compliance level in this area was low. The largest specific issue was failure of the company to conform to the approved number and type of net pens, or site configuration. Compliance to biomass levels show an improvement over the 2001 inspection cycle with 75% of the sites inspected in 2002 in compliance with approved biomass levels.

As described earlier in this report, MAFF has committed to look at ways to streamline the application procedure, in particular for any routine requests for amendments that do not require changes in tenure. Moreover, with the move to outcome-based performance models, appropriate government staff will review and determine what components of the management plan need to be assessed in order to meet our public interest objectives.

For all identified issues of non-compliance with MAFF's regulatory framework, companies have been provided with a letter and copy of the compliance report outlining inspection findings and necessary remedial action.

The majority of salmon farm operators are in the process of, or have implemented, necessary actions identified during inspections. Some follow-up inspections have been completed where companies have failed to comply with remedial instructions or failed to comply within the requested timeframe. Appropriate enforcement sanctions have been applied for those companies that failed to meet necessary requirements including the issuance of violation tickets.

The dive audit program is an important component of the MAFF inspection regime and is one that has been shown to be beneficial. To date the sample size and representative companies that have been included in these surveys is small and findings should be considered with this in mind.

To date however, MAFF Inspectors, with the assistance of these experienced dive teams, have identified a number of deficiencies. In comparison to the findings of regular inspections, the dive audits suggest that companies should be paying more attention to subsurface details as they relate to construction, design and maintenance of equipment and in particular the potential that this equipment might have to come into contact with a containment net.

Companies should continually review the below-water aspect of their operations and ensure that appropriate maintenance and inspections schedules are in place to meet the requirements of the regulations.

MAFF will continue with the dive audit program and as in 2002 a number of sites will again be randomly selected in 2003 to participate in this survey.

The MWLAP inspection results indicate a high level of compliance at the 24 farms inspected. There were, however, only five companies represented in the 2002 inspections so the results do not necessarily reflect the compliance status of industry as a whole.

Not all operating marine salmon farms were assessed against the MWLAP requirements in 2002 as ministry staff only fully assumed the MWLAP inspection role late in the inspection cycle.

In total, MAFF Inspectors noted only 14 areas of non-compliance at 9 of the 24 sites inspected.

Based on the enhancements to our compliance program, recent regulatory changes, staff commitment and the positive response of the client, it is anticipated that inspection results will find that the level of compliance within industry will continue to improve.

[i] Formerly the *Aquaculture Waste Control Regulation*.

[ii] During the 2002 inspections only 30% of the active sites were inspected for MWLAP requirements. This will increase to 100% for 2003.

[iii] ***Appendix 9*** provides a detailed summary of all record keeping requirements and the storage location of these records.

[iv] ***Appendix 9*** provides a detailed summary of all record keeping requirements and the storage location of these records.

[v] Compliance with drug record keeping, and inventory records are examined in other sections within this report.

[vi] ***Appendix 9*** provides a detailed summary of all record keeping requirements and the storage location of these records.

[vii] ***Appendix 9*** provides a detailed summary of all record keeping requirements and the storage location of these records.

[viii] ***Appendix 9*** provides a detailed summary of all record keeping requirements and the storage location of these records.

[ix] As outlined in the report, many sites had submitted management plan amendments prior to inspections conducted in 2002; however, for the purpose of MAFF inspections, sites were identified as out of compliance if amendments had not yet been approved by regulatory authorities. In addition, many sites have since submitted amendments as a result of inspection.

[x] Recapture permits are not site specific, instead they are issued to the company. At the time of inspection no company had been issued the new DFO ZZA permit for 2002. In 2002 the ZZA permits were valid only for Atlantic salmon recapture attempts.

[xi] Only seven of the 24 sites conducted stunning and bleeding operations.

[xii] Only 11 sites used streams as a source of fresh water.

[xiii] No trapping reported in the last 12 months at any of the 24 sites inspected.

[xiv] Only two farms had firearms on site and these were for personal use.

Service Agreement
on
Coordination of Compliance and Enforcement Programs

between

Ministry of Agriculture, Food and Fisheries,
Ministry of Water, Land and Air Protection,
Ministry of Sustainable Resource Management, and
Land and Water British Columbia Inc.

1. Agreed Upon Vision:

A sustainable aquaculture industry that meets high standards for environmental protection and has a high level of public confidence in the compliance and enforcement role of government.

2. Lead Agency Concept:

The Ministry of Agriculture, Food and Fisheries is the lead agency for aquaculture development in British Columbia. Critical functions and authorities also reside within the Ministry of Water, Land and Air Protection (MWLAP), the Ministry of Sustainable Resource Management (MSRM), and Land and Water British Columbia Inc. (LWBC), hereafter referred to as the "agencies".

The lead agency concept is designed to deliver services, permits and approvals to industry through a single window via service agreements, delegations of authority and pre-approval agreements with other agencies in all three levels of government.

3. Development of Service Agreement:

Provincial government representatives are committed to coordinating responsibilities in the area of compliance and enforcement to eliminate inter-agency overlaps, reduce duplication of efforts by single agency presence in the field for compliance activities, increase efficiencies, and to demonstrate a strong, integrated and accountable compliance and enforcement regime.

The agencies wish to identify and clarify respective roles regarding finfish and shellfish aquaculture compliance and enforcement activities, outline specific responsibilities, identify projected resource requirements, and develop protocols for dealing with issues that may arise on occasion.

3. Development of Service Agreement - continued:

This multi-signatory Service Agreement sets out the agreed upon approach between agencies of interest, outlines specific roles and responsibilities, training requirements, implementation timelines and required communication and protocols in responding to identified issues.

4. Goals of Service Agreement:

Development of this Service Agreement is based on the following common goals:

- efficient use of staff resources to minimize duplication;
- one window approach to aquaculture development;
- high level of compliance;
- early intervention to avoid non-compliance;
- effective enforcement, successful prosecution and rehabilitation where required;
- public confidence; and,
- transparency.

5. Performance Based Standards:

This Service Agreement recognizes that government is committed to the development of performance based standards in three key areas: waste management; fish health; and escape prevention. This Service Agreement also recognizes that agencies are working towards a performance-based management regime that acknowledges the key environmental standards.

Signatories to this agreement also acknowledge that application of a combination of regimes, including "rules-based" and "results-based" will be required on an interim basis, until government is satisfied that industry has either achieved or exceeded objectives in the areas of waste management, fish health and escape prevention.

6. Environmental Monitoring

For the purpose of this Service Agreement, it is agreed that environmental monitoring activities pursuant to the *Aquaculture Waste Control Regulation* will remain with the lead regulatory agency, MWLAP, with participation by MAFF Inspection staff. Similarly, the administration of the dive audit program will remain with the lead regulatory agency, MAFF.

6. Environmental Monitoring – continued:

Environmental monitoring activities are to be conducted by biological monitoring staff (technicians, biologists, statisticians) at MWLAP, and, for this reason, are not considered part of the Service Agreement. Specific environmental monitoring activities include:

- conducting reviews of industry environmental monitoring data;
- annual monitoring of sediments at salmon farms;
- development of appropriate sampling protocols and quality assurance/control programs;
- establishing priorities for ministry monitoring of sediments at salmon farms; and,
- conducting environmental sampling at salmon farms, providing feedback to facility.

The agencies agree to conduct joint environmental monitoring activities on site in order to achieve harmonization between compliance inspections and on-site activities. This agreement is subject to operational considerations such as scheduling.

The specific provision on Environmental Monitoring will be reviewed at the end of the first year to ensure identified objectives are being met in the most effective and efficient manner.

7. Compliance and Enforcement – Roles and Responsibilities:

For the purpose of this Service Agreement, it is agreed that MAFF has the lead role in compliance and that MWLAP has the lead role in enforcement. MWLAP will also assume the lead role in consultation with MAFF when environmental conditions at marine finfish facilities exceed the "trigger" level established in the *Aquaculture Waste Control Regulation*.

"Compliance" is defined as conducting the following activities:

- site specific management plan development;
- awareness, education, promotion and training activities;
- partnership and practices activities;
- monitoring, inspections and audits;
- administrative remedies pertaining to agency's licensing authority;
- early intervention to prevent non-compliance;
- provision of data, samples, monitoring results, inspection reports, and fish escape reports to the lead enforcement agency based on a predetermined schedule; and,

7. Compliance and Enforcement – Roles and Responsibilities - continued:

- support for enforcement actions including development of procedures and provision of information, technical support and expert witness support for investigation to ensure the ability of MWLAP to achieve successful prosecution.

"Enforcement" is defined as carrying out the following activities:

- verifying and substantiating an alleged offence;
- recommending and implementing necessary enforcement responses.

Specifically:

a) MAFF Compliance staff will serve as the lead in developing site specific management plans and conducting all finfish and shellfish inspections, monitoring (subject to section 6) and audits on behalf of MWLAP, LWBC, and MSRM.

a) MWLAP Enforcement staff will serve as the investigative lead on all enforcement activities associated with formal prosecutions, court orders and administrative penalties for finfish and shellfish aquaculture on behalf of MAFF, LWBC and MSRM.

MAFF and MWLAP Compliance and Enforcement Managers will work with LWBC, MSRM and federal DFO officials to harmonize compliance and enforcement activities and develop a protocol on sharing information, participating in inspections and enforcement as required, and addressing common issues of interest.

8. Transition from Inspection to Investigation:

MAFF Compliance staff will contact MWLAP Enforcement staff to initiate an investigation when instance(s) of non-compliance by an operator requires further review or action by the lead agency for enforcement. Specific responses will be outlined in a matrix to be developed by respective Compliance and Enforcement Managers.

It is anticipated this transition will involve consultation, a request for shared inspections and/or a request to consider enforcement sanctions such as formal prosecutions. MAFF will provide a support role to MWLAP enforcement staff as required when a request for an investigation has been made.

8. Transition from Inspection to Investigation - continued:

For the purpose of this Service Agreement, MWLAP Enforcement staff and MAFF Inspection staff will regularly communicate on status of inspections and files and activities undertaken by either agency. MAFF Inspection staff may issue violation tickets as defined within the matrix. The matrix will indicate under which circumstances agencies must consult prior to proceeding with enforcement action.

Escapes:

- MAFF Compliance staff will attempt to visit sites within 72 hours of discovery of an escape incident. Where possible, particularly with escape incidents that are viewed as "significant", MWLAP Enforcement staff will attend jointly with MAFF Compliance staff.

- The role of MAFF Compliance staff will be to ensure appropriate measures have been implemented to preclude further escapes and provide technical support for the investigation where required.

- The role of MWLAP Enforcement staff will be to assess the state of compliance leading up to and including the actual event, and to conduct a legal investigation to determine the appropriate enforcement response.

Appendix I provides the detailed compliance continuum and breakdown of agency activities and responsibilities.

9. Communication and Protocols:

In order to ensure an environment of trust and respect, effective communication between agencies is necessary.

It is agreed:

- that compliance and enforcement activities and responsibilities are clearly defined and communicated with all staff;

- where an aquaculture activity has resulted in a significant impact of mutual concern, a jointly agreed upon briefing note will be forwarded to the Executive of all agencies. Inter-agency compliance and enforcement staff will work together to develop the briefing notes;

9. Communication and Protocols - continued:

- that information regarding an investigation being pursued by MWLAP staff is considered highly confidential and distribution must be limited to only those operational staff involved in the file. It is agreed that if charges are approved by Crown on an investigation, that Executive and Communications staff will be advised once charges have been sworn in and the company has been advised;

- that communication of data, samples, monitoring results and inspection reports between the agencies will be transparent, timely and direct, to allow either agency to make independent judgements about the state of compliance at any time;

- that all compliance and enforcement activities are complementary and mutually supportive in nature;

- that clear policies and procedures are created that will outline how agencies will communicate with one another; and,

- that the agencies will be mutually involved in the development of compliance strategies and workplans and agree that MAFF/LWBC/MSRM compliance staff (as appropriate) will be consulted on decision points regarding appropriate or possible enforcement responses by MWLAP staff.

10. Resolving Differences:

Where conflict arises relative to different opinions within the scope of relevant authorities or appropriate sanctions, it is agreed that differences are to be resolved as quickly and efficiently as possible by staff involved in discussions, and at a maximum, within 30 days of the issue being identified.

If satisfactory resolution can not be achieved, matters will be raised to the Regional Enforcement Manager for MWLAP, the Manager of Aquaculture Licensing and Compliance in MAFF, the Regional Manager of MSRM, and the Regional Director of LWBC.

If the issue in question can not be resolved within 14 days at this level, it will be brought forward to respective Assistant Deputy Ministers for discussion and resolution within 14 days.

11. Proposed Implementation Timelines:

January, 2002	-	Approval in principle to coordinated compliance and enforcement regime by Deputy Ministers.
February, 2002	-	Development of Service Agreement between agencies of interest.
Feb./March, 2002	-	Approval and sign-off of Service Agreement between agencies of interest. Approval by CORE review table.
March, 2002	-	Development of "Compliance Strategy Matrix".
April to July, 2002	-	Training for both staff – will be conducted by on-site training inspections and participating in one or more joint enforcement investigations
	-	Arrange appropriate powers and delegated authorities for staff.
April, 2003	-	Transition phase complete

12. Training Requirements:

Agencies agree that joint training for appropriate staff will be undertaken to deliver on this Service Agreement.

13. Delegation of Authorities:

To effectively administer the numerous statutes that apply to finfish and shellfish aquaculture, delegation or appointment of authority is necessary. MAFF Inspectors will require specific powers to collect inspection data and specific delegated authorities to inspect operations pursuant to both LWBC's and MWLAP's statutory framework.

In most cases, legislation appears to provide the appropriate Minister power to delegate authorities.

Appropriate agencies will work with the Aquaculture Licensing and Compliance Manager to move forward and expedite necessary approvals for MAFF Inspection staff to secure delegated authorities.

14. Resource Requirements:

For the inception of this Service Agreement, it is assumed that resource requirements between agencies will remain the same. Discussions on ability of the agencies to meet identified objectives will occur at the end of the first year of this agreement.

15. Transparency of Data:

This Service Agreement recognizes the requirement to provide the public with clear, transparent and accountable data on the state of compliance for finfish and shellfish aquaculture industries.

It is agreed that information collected and subsequent enforcement results will be collected and submitted in a joint agency report for distribution to industry and the public via an acceptable medium. The responsibility for completion of this Annual Report will reside with the appropriate Managers/Directors in the agencies. It is expected that the first joint report will be completed and published on or before April, 2003.

16. Service Agreement Requirements:

Immediate Requirements:

a) Agreement and sign-off on all requirements set out in Implementation Timelines, above.

b) Draft policies and procedures on how and when agencies will communicate.

c) Develop overall compliance strategy and workplan for inspection cycle commencing 2002, incorporating necessary training requirements in the workplan.

d) Confer necessary delegated authorities on MAFF Inspection staff.

Quarterly Requirement:

a) Meeting or conference call with respective Managers/Directors to discuss issues and resolve concerns.

b) A regular quarterly review meeting between appropriate Assistant Deputy Ministers and Deputy Ministers will be necessary to ensure the goals set out in this Service Agreement are being achieved.

17. Service Agreement Requirements - continued:

Annual Requirements:

a) All elements contained within the Service Agreement will be reviewed annually by respective Managers/Directors responsible for compliance and enforcement. Recommended changes to scope of agreement will be forwarded to appropriate Executive staff for discussion, agreement and implementation. Any agreed upon changes will be submitted via amended Service Agreement with appropriate signatory sign off.

b) Review of respective resources, compliance strategy and workplan elements will be conducted to determine if resources are appropriately allocated. Any reallocation requests will be forwarded to respective Executive staff for review, discussion and approval.

c) Respective agency Managers/Directors responsible for compliance and enforcement will measure the effectiveness of both the compliance and enforcement programs to ensure identified objectives are being met, including licensing and legislative. Adjustments in workplan activities will be modified as appropriate.

18. Termination of Service Agreement:

It is agreed that the Deputy Minister of Water, Land and Air Protection or the Deputy Minister of Agriculture, Food and Fisheries, the Chief Executive Officer for Land and Water British Columbia Inc. and the Deputy Minister of Ministry of Sustainable Resource Mangement may terminate this Service Agreement by providing 90 days notice in writing.

19. Signatories:

For Ministry of Agriculture, Food and Fisheries

Deputy Minister
Agriculture, Food and Fisheries

March 28/02
Date

For Ministry of Water, Land and Air Protection

Deputy Minister
Water, Land and Air Protection

March 28/02
Date

For Ministry of Sustainable Resource Management

Deputy Minister
Sustainable Resource Management

March 28/2002
Date

For Land and Water British Columbia Inc.

Chief Executive Officer
Land and Water British Columbia Inc.

March 28/02
Date

Appendix I

Service Agreement
Breakdown of Compliance Continuum
Activities by Agency

Ministry of Agriculture, Food and Fisheries

Awareness, Education, Promotion and Training Activities:
- advising public of the requirements of the law;
- consultations with parties affected by the law;
- communications strategies and public reporting of the compliance program;
- training programs for staff, clients and other interested parties.

Partnerships and Practices:
- developing cooperative partnerships and agreements contributing to government objectives, including building on and coordinating activities with federal authorities;
- building on reliance on professionally qualified persons;
- promoting industry best management practices (Codes of Practice/Conduct);
- promoting self-monitoring/auditing and reporting on practices;
- promoting International Certification.

Monitoring, Inspections, Audits:
- receiving information/data (with exception of environmental monitoring data) provided by finfish or shellfish sector and forwarding to appropriate regulatory agency;
- conducting all inspections and follow-up inspections (with exception of environmental monitoring program) and audits in the field on behalf of LWBC, MSRM and MWLAP;
- conduct follow up with operators on results of inspections and required remedial actions – identified non-compliance issues under MWLAP's regulatory authority will be referred for discussion and/or appropriate follow-up to MWLAP;
- acting as initial contact for public and industry complaints with respect to issues provided under finfish and shellfish licence terms and conditions, the provincial *Fisheries Act*, *Aquaculture Regulation*, and in the case of shellfish aquaculture, the *Land Act*; and,
- dependent on necessary mitigative measures for farms in excess of chemical trigger, MAFF Inspection staff may conduct monitoring and inspections.

Administrative Remedies:
- aquaculture licence suspension or cancellation proceedings.

Appendix I - continued

Service Agreement
Breakdown of Compliance Continuum
Activities by Agency

Ministry of Water, Land and Air Protection

Mitigative Measures:

- evaluation of remediation plans (where required) when farms exceed the chemical trigger prescribed in the *Aquaculture Waste Control Regulation*;
- implementation of mitigative measures (where required) for farms that have exceeded the chemical trigger and/or standards.

Enforcement:

- verifying and substantiating an alleged offence;
- implementing necessary enforcement responses on behalf of all finfish and shellfish aquaculture activities in the province, including finfish escapes. Enforcement activities are defined as warnings, tickets, administrative penalties, orders and formal prosecutions for governing statutes and regulations.
- Referring investigative files to the appropriate agency where it is determined that the application of administrative sanctions (penalties, license/tenure suspension/cancellation) are appropriate.

LWBC and MSRM

Both agencies will provide MAFF Inspection staff and MWLAP Enforcement staff with necessary information in completing activities. Examples may include digital aerial photographs and licence and tenure documents.

- Amendment of tenure boundaries and license conditions to resolve minor non-compliance.

- Suspension/cancellation of water licenses or land tenures and imposition and recovery of tenure fees for trespass.

- Support for enforcement actions including development of procedures and provision of information, technical support and expert witness support for investigation to ensure the ability of MWLAP to achieve successful prosecution.

Appendix II

Mutual Areas of Concern – Compliance and Enforcement[1]
MWLAP and MAFF

Issue:
Operation conducted within approved tenure boundaries
Farm sites well marked and posted
Access to water so as not to impede riparian rights
Diligent Use
Environmental Monitoring
Method and location of blood water and disposal
Method and location of net cleaning, waste treatment and disposal
Use of freshwater from a stream/lake
Feed Handling, type and volume
Method of mort disposal and location
Wildlife/predator destruction, disposal method and location
Firearm and ammunition storage and possession
Sewage treatment and disposal
Method and location of refuse storage and disposal
Spill containment for hazardous materials including footbaths
Environmental management
Chemical and fuel storage
Premises appropriately licensed for aquaculture
Culturing approved species with management plan(s)
Compliance with licence conditions and special provisos
Annual or quarterly reporting requirement compliance
Harvested product appropriately tagged (shellfish)
Product sold to registered Fish Processors
Appropriate use of tenure (mitigate laundering of illegally harvested product)
Record keeping requirements such as stock inventory, mortality records
Escape prevention and response programs
Boat operations
Net cage deployment, including net weighting and system anchoring
Predator avoidance plans including feed storage and predator control
Net maintenance, marking and record keeping
Daily inspections and logs
Administration of drugs
Compliance with management plans, including site configurations, biomass and approved species

[1] Mutual areas of concern also include both finfish and shellfish issues reviewed by MAFF and MWLAP on behalf of other agencies such as LWBC (i.e., operation conducted within approved tenure boundaries).

MINISTRY OF AGRICULTURE, FOOD AND FISHERIES

FINFISH AQUACULTURE LICENSING POLICIES AND PROCEDURES FOR APPLICATIONS

Created: August 31, 2000
Revised: August 25, 2003

Note: This document is subject to regular review and revision.

1. Purpose

The purpose of the policy is to provide guidance to licensing authorities on the consideration of licences for the purposes of marine finfish aquaculture.

This policy is intended to assist in the exercise of discretion of the licensing authority and does not purport to alter any provisions of the *British Columbia Fisheries Act, the British Columbia Aquaculture Regulation*, or other relevant legislation.

2. Legislative and Regulatory Authority

British Columbia Fisheries Act
British Columbia Aquaculture Regulation

3. Decision-Makers

Minister of Agriculture, Food and Fisheries: Fisheries Act
Manager, Licensing and Compliance Branch: Delegated Authority
Senior Licensing Officer: Delegated Authority
Aquaculture Licensing Specialist: Delegated Authority

4. General Principles Governing the Exercise of Authority to Issue a Salmon Aquaculture Licence

- Fairness
- Transparency
- Efficiency
- Accountability

5. Application for Salmon Aquaculture Licence

5.1. Application form and information required

The applicant must complete a Commercial Finfish Aquaculture Management Plan ("Plan"). The Plan is the application form for an aquaculture licence and also, where required, a Crown land tenure.

The Plan is submitted to the Ministry of Agriculture, Food and Fisheries (MAFF).

MAFF may request further information that assists in the review and adjudication of the application.

5.2. Questions and Assistance

MAFF's Aquaculture Development Branch will work with the applicant to provide any required assistance in completing the Plan.

6. Referrals

The Plan may be referred to other government departments and agencies for review and comment. These agencies may include the federal Department of Fisheries and Oceans, the BC Ministry of Aboriginal Affairs, the BC Ministry of Water, Land and Air Protection, Land and Water BC Inc., local governments, and other agencies and organizations as appropriate.

Where the application has a potential to impact a First Nation's rights or interests, First Nations will be consulted in accordance with the applicable First Nations consultation protocols.

7. Public notice and consultation

Reasonable efforts will be made to notify affected parties and provide them with an opportunity to comment on the application.

MAFF may require the applicant to provide public notice of the proposed application in a manner that is acceptable.

8. Applicant's Response

The applicant will be provided with an opportunity to respond to any relevant material or information provided through the referral and public consultation process.

9. Decision

The Minister or delegated licensing authorities may, upon receipt of an application for a salmon aquaculture licence:

- issue a salmon aquaculture licence on terms and conditions that the Minister or licensing authority deems reasonable in the circumstances;
- deny the application; or
- decline to make a decision and refer the Plan back to the applicant for further information.

The applicant will be notified of the decision in writing, with reasons as appropriate.

10. Issuance of a Salmon Aquaculture Licence if in the Public Interest

Given that a salmon aquaculture licence confers a right to carry on the business of commercial aquaculture using a valuable public resource, a licence should only be issued if it is in the public interest to do so.

In deciding whether it is in the public interest to issue a salmon aquaculture licence, the licensing authority should consider the following paramount principles:

- Protection of public health and safety;
- Protection of the environment;
- Sustainable economic development.

11. Assessment of an Application for a Salmon Aquaculture Licence

In assessing an application, the licensing authority may consider any of the following:

11.1. Requirements of the *Fisheries Act and Aquaculture Regulation*

The licensing authority may consider whether the applicant has met all the requirements of the *Fisheries Act and Aquaculture Regulation*.

11.2. Completion of Forms

The Plan and any supporting documentation should be complete prior to the application being considered by the licensing authority.

11.3. Suitability of Site/Facilities for Proposed Aquaculture Operation

Based on the recommendations of Aquaculture Development Branch staff, the licensing authority should consider whether the proposed site has the biophysical capacity to support the proposed operation.

11.4. Past or Demonstrable Performance of Applicant

This may include a review of the following:

- Whether the operator has any previous convictions under the provincial *Fisheries Act, Aquaculture Regulation* or other relevant legislation;
- Whether the operator has been the subject of any aquaculture licence suspensions, cancellations or refusals to issue licences in accordance with Sections 18 or 19 of the *Fisheries Act*;
- Whether there are any outstanding Fisheries Act fees or royalties owed to the Crown in relation to any other aquaculture or commercial seafood licences currently or previously held by the applicant;
- The financial capacity and stability of the applicant to support the proposed operation, including liability insurance;
- That the applicant has appropriate and sufficient experience/qualifications in aquaculture operations.

11.5. Comments from Referrals

The licensing authority should consider the comments of all parties consulted in the referral process (refer to section 6, above).

11.6. Public Input/Comments

The licensing authority may consider the impact of the proposed operation on other uses, users and resources within the area of operation.

The licensing authority may consider the adequacy of public notice and public input.

The licensing authority may consider the nature and extent of local community support for the proposed operation.

11.7. Economic and Employment Benefits

The licensing authority may consider the significance of the contribution of the operation to the local and provincial economy. This may include an identification and review of the impact on secondary businesses and industries.

The licensing authority may consider whether the proposed operation will involve technological innovations or enhancements that may lead to improvements in the standards of operation for the salmon aquaculture industry.

11.8. Escape Prevention, Detection and Response

The licensing authority may consider the adequacy of the applicant's measures and plans regarding the prevention, detection and response to escapes of finfish.

11.9. Consultations with other individuals and agencies

The licensing authority may consult with other individuals or bodies as deemed appropriate. They may include:

- The Aquaculture Biologist, Aquaculture Development Branch, or equivalent;
- The Ministry of Agriculture, Food and Fisheries Fish Health Veterinarian.

11.10. Other Relevant Factors

The licensing authority may also consider any other factors relevant to the specific circumstances of each case.

12. Terms and Conditions of Licence

The licensing authority may issue a licence on terms and conditions deemed appropriate in the circumstances.

13. Reporting and Monitoring

MAFF Fisheries Inspectors will ensure compliance with the *Fisheries Act*, *Aquaculture Regulation*, and terms and conditions of the aquaculture licence through reporting and the conducting of regular inspections and other monitoring activities as appropriate, including spot audits.

Any noted activities of non-compliance will be reported to the Senior Licensing Officer.

Note: A pre-operation inspection by a MAFF Fisheries Inspector will be required for any new operation.

14. Renewal of Existing Licences

In considering renewal of an existing licence, the licensing authority may apply any or all of the policy as appropriate in the circumstances.

15. Suspension and Revocation

Licences may be suspended or revoked in accordance with section 18 of the *Fisheries Act*.

Salmon Farm Relocation Summary Report
(As of July 25, 2003)

The salmon farms on this list have been identified by the Province of British Columbia for priority relocation for either environmental or social reasons. The reference numbers in brackets are Crown land tenure file numbers from Land and Water BC. For further information on finfish aquaculture tenuring go to – http://www.lwbc.bc.ca/applying_for_land/finfish.htm

a. Completed Relocations/Mitigations

Company	Proposed Relocation Site	LWBC Status	Agency Referrals Sent	CEAA Status	Moving from
Kitasoo Aquafarms/ Marine Harvest	Jackson Passage (6406814)	Complete May 16, 2000	Apr. 17, 2000	Complete Oct 12, 2000	Kanish Bay (1402860)
Liard Aquaculture (Omega Salmon Group)	Hardwicke 'B' (1409321)	Complete Dec. 31, 2000	May 5, 1999	Complete Sept. 18, 2000	Chancellor Channel 'A' (1407982)
Omega Salmon Group Ltd.	Marsh Bay (1407749)	Complete Sept. 28, 2000	May 9, 2000	Complete Feb. 28, 2001	Sansum Narrows (1405114)
Stolt Sea Farms	Doctor Islets (1408758)	Complete Apr. 27, 2001	July 6, 2000	Complete Sept 11, 2001	Carrie Bay (1404990)
Omega Salmon Group Ltd.	Robertson Island (1407822)	Complete Dec. 31, 2000	Jun 30, 2000	On Hold at Client's request	Redonda Bay (2403801)
Kitasoo Aquafarms/Marine Harvest	Arthur Island (6406836)	Complete Oct. 5, 2001	Aug. 9, 2000	On Hold at Client's request	Orchard Bay (1405412)
Creative Salmon Company Ltd.	Fortune Channel, Clayoquot Sound (1409666)	Complete Oct. 19, 2001	Feb. 5, 2001	In progress Advanced	Fortune Channel (1403915)
Homalco First Nation (Heritage Aquaculture Ltd is a business partner)	Downey Range (2407768)	Completed Oct 17, 2002 as a two year experimental licence	Nov 17, 2000	In progress Mid point	San Mateo Bay (1401284)
Stolt Sea Farms	Humphrey Rock (1409707)	Tenure offer accepted Feb. 7, 2002 subject to Federal approvals	Apr. 10, 2001	Complete March 2003	Eden Island (1405020)
Kitasoo Aquafarms & Marine Harvest	Kid Bay (6406984)	Tenure offered June 5, 2002 subject to Federal approvals	Dec. 20, 2001	Completed July 2003	Conville Point (1403859)
Omega Salmon Group Ltd.	Masterman (1411041)	Tenure offered June 18, 2002 subject to Federal approvals	Dec. 31, 2001	On Hold at Client's request	Loughborough, paired site (1406566)
Target Marine	Ahlstrom Point, Jervis Inlet (2408042)	Tenure offered Aug 13, 2002 subject to Federal approvals	Mar. 25, 2002	In progress Mid-point	Hardy Island (2402613)
Target Marine	Culloden Point, Jervis Inlet (2408043)	Tenure offered Aug 13, 2002 subject to Federal approvals	Mar. 25, 2002	In progress Mid-point	Hardy Island (2402615)
Kitasoo Aquafarms/Marine Harvest	Goat Cove, Roderick Island (6407324)	Tenure offer Aug 21, 2002 subject to Federal approvals	May 16, 2002	Completed July 2003	Bear Bay, Read Island (1401611)
Omega Salmon Group Ltd.	Goletas Channel (1404918)	Client has resolved conflict with Park boundary and is applying for Park Use Permit	Sept 16, 2002	In progress Preliminary	Stayed on site by resolving anchoring conflicts

DFO = Fisheries and Oceans Canada
NWPA = Navigable Waters Protection Act
MP = Marine Commercial Finfish Aquaculture Management Plan

CEAA = Canadian Environmental Assessment Act
FN = First Nation government
Preliminary, Midpoint & Advanced = CEAA progress
CSRD = Comox Strathcona Regional District

Salmon Farm Relocation Summary Report
(As of July 25, 2003)

a. Completed Relocations/Mitigations (continued)

Company	Proposed Relocation Site	LWBC Status	Agency Referrals Sent	CEAA Status	Moving from
Marine Harvest	Markale Passage, Hohoae Island (1411078)	Completed Feb 4, 2003	July 29, 2002	Completed July 2003	Samsun Narrows (1406755)
Stolt Sea Farms	Victoria Lake (1409830)	Completed Apr 4, 2003	Nov. 22, 2001	In progress Mid-point	Keogh Lake (1403242)

b. Completed Pilot Project Siting

Company	Proposed Relocation Site	LWBC Status	Agency Referrals Sent	CEAA Status	Moving from
Kitasoo Aquafarms/ Marine Harvest	Oscar Passage (6406898)	Tenure offered January 31, 2002 subject to Federal Approvals	Feb 01, 2001	On Hold at Client's request	Replacement for Lochalish Pilot project (6403484)
Hatfield Biotechnology/Marine Harvest	Church House (2407932)	Tenure offered January 31, 2002 subject to Federal approvals	July 12, 2001	Completed	Replacement for Saltspring Pilot Project (1401514)
Agrimarine Ltd./Grieg Seafoods	Muchalat Inlet South, Nootka Sound. (1411064)	Tenure offered Sept 13, 2002 subject to Federal Approvals	May 13, 2002	In progress Advance	Paired marine site for Private land based pilot project
Future Sea Technologies Inc.	Maynard Lake, Port McNeill	Tenure offered Aug 9, 2002 subject to Federal approvals	May 22, 2002	Completed	N/A
Totem Oysters Ltd./Grieg Seafoods	Williamson Point, Nootka Sound (1411068)	Tenure offered Sept 13, 2002 subject to Federal Approvals	June 3, 2002	In progress Preliminary	Paired marine site for Jervis Inlet pilot project (0298167)

c. Relocations in Progress

Company	Proposed Relocation Site	LWBC Status	Agency Referrals Sent	CEAA Status	Moving from
Stolt Sea Farms	Dinner Point, Knight Inlet (1411082)	Application being statused; biophysical assessment commenced. Parked till September 30, 2003, client to provide further information	Dec 20, 2002	In progress	Mistake Island (1404780)

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Salmon Farm Relocation Summary Report
(As of July 25, 2003)

d. Relocations or Pilot Project Sites on Hold

Company	Proposed Relocation Site	Status	Moving from
Heritage Aquaculture Ltd.	Clipper Point (2407767)	No longer being processed due to failure of rezoning at CSRD.	Penny Creek (1406618)
Heritage Aquaculture Ltd.	Paradise River, Bute Inlet (2404325)	No longer being processed due to failure of rezoning at CSRD.	New pilot project site
Omega Salmon Group Ltd	Kent Island (1409640)	Referrals sent Dec. 12, 2001. Tenure offered Feb. 8, 2002. CEAA completed Aug 14, 2002 that determined the project would cause significant adverse environmental effects.	SE Fredrick Arm (2402966)
EWOS	Millar Channel (1411061)	Application no longer being processed. Reactivation possible if further data is supplied.	Sooke Basin (1403903)

e. Relocations not yet Commenced

Company	Proposed Relocation Site	Status	Moving from
Creative Salmon Company	Gov't agencies awaiting MP	Proponent is meeting with FN and preparing to submit MP	McCaw Peninsula (1406335)
EWOS	Gov't agencies awaiting MP	Proponent is meeting with FN and preparing to submit MP	Goodridge Island (1401188)
EWOS	Gov't agencies awaiting MP	Proponent is meeting with FN and preparing to submit MP	Belcher Point (1403297)
EWOS	Gov't agencies awaiting MP	Proponent is meeting with FN and preparing to submit MP	Obstruction Island (1403679)
Heritage Aquaculture Ltd.	Gov't agencies awaiting MP	Proponent is preparing to submit MP	Simoon Sound (1403895)
Heritage Aquaculture Ltd.	Gov't agencies awaiting MP	Proponent is preparing to submit MP	Cypress Harbour (1405381)
Saltstream Engineering	Gov't agencies awaiting MP	Proponent is preparing to submit MP	Doctor Bay (0193432)
Stolt Sea Farms	Gov't agencies awaiting MP	Proponent is preparing to submit MP for smolt entry only	Potts Bay (1406655)
Stolt Sea Farms	Gov't agencies awaiting MP	Proponent is preparing to submit MP to convert the purpose to shellfish use	Mound Island (1404264)
Stolt Sea Farms	Gov't agencies awaiting MP	Proponent is preparing to submit MP to convert the purpose to shellfish use	Broughton Island (1403326)

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BRITISH COLUMBIA NET CAGE MESH STRENGTH TESTING PROCEDURE

VERSION I
March, 2002

BRITISH COLUMBIA

Ministry of Agriculture,
Food and Fisheries

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1. SCOPE

This procedure specifies the method that must be used in British Columbia for the purpose of determining the tensile (breaking) strength of mesh used for the containment of farmed fish.

This procedure is intended for use with nets common to the BC finfish aquaculture industry. These nets are generally made with knotless nylon mesh with published breaking strengths of between 50 and 400 lbs. This procedure may not be suitable for other types of nets.

2. PRINCIPLE

A mesh is extended until it ruptures under the applied load. The test is performed using a suitable apparatus that records or indicates the load at the point of rupture. The testing machine is operated at a rate of elongation which is both constant and within prescribed limits.

3. APPARATUS

3.1 Testing Machine

The machine used for testing shall meet the following criteria:

a) Machine shall include a digital load cell or dynamometer providing direct measurement (in units of force) of the load applied to the mesh. The load cell or dynamometer shall be accurate to within 2.5 lbs (11 N), or 1.0% of the mesh breaking strength, whichever is greater.

b) The load cell or dynamometer shall have an accurate means of recording the peak load applied prior to failure of the mesh.

c) Machine shall apply load to a single mesh at a constant rate of elongation equal to 10 inches per minute (25 cm per minute), plus or minus 10%.

d) For testing machines which apply force in discrete steps (such as by way of a hydraulic cylinder with a hand pump), the rate of elongation, per (c) above, shall be the average rate of elongation. During each step, the rate of elongation shall be as close as possible to the average rate required, that is the steps must be consistently applied at a given rate. The maximum mesh elongation for each step shall be 0.20 inches (5 mm). Testing machines of this nature shall be designed such that the user can readily apply the load at a rate that will meet these requirements.

e) The machine shall engage a single mesh for testing with steel pins or hooks formed from round material with a diameter of 0.1875 inches (5 mm) The pins or hooks shall be so mounted as to remain in direct line with the applied load in order to provide a true reading on the load cell or dynamometer. The pins or hooks shall be smooth and free of any sharp edges or roughness.

3.2 Calibration and Maintenance

The dynamometer or load cell from each testing machine shall be calibrated annually in accordance with the manufacturer's recommendations. Testing machines shall also be calibrated annually to ensure that the specified elongation rate is maintained. The owner of the machine shall keep calibration certificates on file, with a copy kept with the machine.

The testing machine shall be properly maintained in order to continue to provide accurate results and to meet the requirements above. This will include replacement of the testing hooks as necessary due to wear, corrosion or roughness.

4. TESTING REQUIREMENTS

4.1 A net cage must be tested according to the testing protocol in Section 5 of this document at the following locations:

(a) two locations separated by greater than 10 meters on the underwater portion of the net; and

(b) one location on the jump net.

4.2 For each location tested on a net cage, the reported result must be the average of 5 breaks.

4.3 Test locations shall be representative of the mesh making up the whole net, and shall not be located in a previously repaired area. If a net has large areas of repair or is fabricated from different sources of mesh, the test procedure (Section 5) shall be performed on each different mesh type or age of mesh, and the reported result must be the average of 5 breaks.

4.4 Testing may be done on mesh remaining in the net or on a sample cut from a net. Cut samples shall be large enough to accommodate the required number of breaks within a single sample.

4.5 Testing done on mesh remaining in the net shall be performed by pulling the net slack around the area to be tested, such that no outside forces are acting upon the mesh being tested, and maintaining such slack for the duration of the test.

4.6 Testing may be performed on dry or wet mesh. Temperature shall be within normal ambient temperatures for the B.C. coast. Tests shall not be conducted on frozen mesh.

***NOTE:** 'Mesh size' refers to the distance between the centers of two opposite joints (or knots) in the same mesh when fully stretched; this information should be obtained from the original tagging on the net cage.

5. TEST PROCEDURE

5.1 Testing shall be performed on a single mesh, oriented so that the pillars (bars) of the mesh are engaged over the pins or hooks, not the knots or joints of the mesh.

5.2 Mount the mesh over the pins or hooks, and take up the slack.

5.3 Apply load at a steady rate of elongation, as defined in 3.1, until the mesh breaks. Record the peak load indicated.

5.4 Repeat for a total of five breaks at the location being tested.

5.5 Average the five results to get the recorded breaking strength for that location.

Example: 200 lbs, 210 lbs, 230 lbs, 195 lbs, 185 lbs

Record breaking strength of (200+210+230+195+185)/5 = 204 lbs

5.6 Record breaking strength to the nearest pound force.

6. REPORTING

Test results shall be recorded on a form that also includes information about the net. Information recorded shall include:

a) Owner of net and net identification number.

b) Mesh manufacturer and manufacturer's published mesh-breaking strength.

c) Net fabricator and date of net fabrication.

d) Accumulated in-water service time.

e) Size and gauge of mesh and dimensions of net cage.

f) Date and location of testing, company and name of person doing test.

g) Information on antifoulant treatment of net, if any.

h) Whether net was tested wet or dry.

i) Approximate ambient temperature at test.

j) Breaking strength test results for each prescribed location, and pass/fail grades per requirements of the Aquaculture Regulation, Appendix 2, section 12.

i) General comments and notes on overall condition of net.

j) Signature of tester.

7. ADDITIONAL INFORMATION

For more information or a printed copy of this document, please call the Courtenay office of the Ministry of Agriculture, Food and Fisheries at (250) 897-7540.

An electronic version of this document is available on the Government of British Columbia web site: www.gov.bc.ca/agf

8. EXAMPLE REPORTING FORM

NET CAGE TESTING RECORD

Date of Testing:	Net ID:	Job Order No.:

Owner of Net (Company):	Name of Company performing testing:	
Name of Contact:	Location of Testing:	Name of Tester:

Mesh Manufacturer:	Dimensions: (ft) or (m)? _____x_____x _____deep:
Net Fabricator:	Mesh Size (mid knot to mid knot): (in) (mm)
Date of Net Fabrication: / Accumulated in-water service time:	Gauge: 210/
Mesh Manufacturer Breaking Strength (lbs):	Tested: WET or DRY ?
Required Strength (lbs or kg ?) BELOW WATERLINE: JUMP:	Test temperature (approx.):

Breaking Strength (lbs or Kg ?)

	Dipped?	Test 1	Test 2	Test 3	Test 4	Test 5	Average	Pass/ Fail	Initials of Tester
BELOW WATERLINE 1	Yes ☐ No ☐								
BELOW WATERLINE 2	Yes ☐ No ☐								
JUMPNET	Yes ☐ No ☐								

Details of Complete Visual Inspection:

Repairs Completed:

Comments:

Signature of Tester:

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Important Information (disclaimer and copyright information)

B.C. Reg. 78/2002
O.C. 283/2002

Deposited April 19, 2002

Fisheries Act

AQUACULTURE REGULATION

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Appendix 1: Schedule of Fees

Appendix 2: Standards of Practice for Marine Finfish Aquaculture Escape Prevention and Response

Interpretation

1 In this regulation:

"Act" means the *Fisheries Act*;

"aquaculture licence" means a licence referred to in section 13 (5) of the Act;

"aquaculture facility" means an establishment where the business of aquaculture is carried on;

"attachment structure" means mollusc shell, rope, netting, tubing or other structures provided as substrate for the attachment of aquatic plants and fish for purposes of aquaculture;

"bag cage" means an enclosure in a marine or lake environment

(a) made of material impermeable to water, and

(b) used to contain fish;

"cage support system" means a floating infrastructure and anchoring system that supports net cages, bag cages and ancillary equipment;

"containment structure" means cage support systems, net cages, bag cages, tanks, troughs, raceways, natural or man made ponds, trays or other structures used to contain aquatic plants or fish for purposes of aquaculture;

"drug" means a drug as defined in the *Pharmacists, Pharmacy Operations and Drug Scheduling Act* or the *Food and Drugs Act* (Canada);

"finfish" means fish of the classes Agnatha, Chondrichthyes or Osteichthyes grown by a holder;

"holder" means the person to whom an aquaculture licence is issued;

"manager" means the manager of aquaculture in the minister's ministry;

"net cage" means net enclosures used to contain fish.

Dealing in fish or aquatic plants

2 (1) A person must not possess, buy, sell, introduce into British Columbia or transplant within British Columbia fish or aquatic plants for the purpose of carrying on the business of aquaculture unless the person is a holder or is acting on behalf of a holder.

(2) Subsection (1) does not prevent a person who has taken the fish or aquatic plants as collateral for a loan from seizing or disposing of the fish or aquatic plants or otherwise realizing on the person's interest in the fish or aquatic plants to satisfy the obligations secured by them.

Release and escape

3 (1) A person must not release aquatic plants or fish, or cause, authorize or allow the release of aquatic plants or fish, to fresh or tidal waters from an aquaculture facility or from a containment structure or an attachment structure in an aquaculture facility unless authorized to do this by an aquaculture licence.

(2) A holder must take reasonable precautions to prevent the escape of aquatic plants and fish from the holder's aquaculture facility and from a containment structure or an attachment structure in the aquaculture facility.

(3) A holder must take all reasonable measures to control, mitigate, remedy and confine the effects of an escape or a suspected escape of aquatic plants or fish from the holder's aquaculture facility.

(4) Reasonable precautions and reasonable measures under subsection (2) and (3) in the case of a marine finfish aquaculture facility must include compliance with the standards of practice in Appendix 2 of this regulation.

Reporting escape

4 (1) The holder, or a person acting on behalf of the holder, who discovers an escape or evidence suggesting an escape of finfish from an attachment structure or a containment structure in the holder's aquaculture facility must report the escape or evidence to the manager

(a) verbally, within 24 hours of the discovery, and

(b) in writing, within one week of the discovery.

(2) A written report under subsection (1) (b) must include:

(a) the date, estimated time and location of the escape or suspected escape,

(b) the species of finfish that escaped or may have escaped,

(c) the estimated number of finfish that escaped or may have escaped,

(d) the cause or suspected cause of the escape or suspected escape,

(e) the calendar year in which the finfish were stocked at the aquaculture facility,

(f) the average weight of the finfish that escaped or may have escaped,

(g) the rearing facility from which the finfish were received by the aquaculture facility, and

(h) a record of each drug administered to the finfish including:

(i) the name of the drug,

(ii) the period of administration, including the dates of commencement and completion of the drug treatment,

(iii) the name of the prescribing veterinarian,

(iv) the prescribed withdrawal period, and

(v) identification of the lots of finfish treated.

(3) A holder who recaptures or attempts to recapture finfish that have escaped from an aquaculture facility must report in writing the results of the recapture or attempt to recapture to the manager within one week of the recapture or attempted recapture.

Inventory records

5 (1) For each finfish aquaculture facility of a holder, the holder must maintain accurate written records of the following for each containment structure in the aquaculture facility:

(a) the transport, transfer and introduction of finfish into or away from the aquaculture facility;

(b) the weekly finfish mortalities, including the causes of the mortalities and the numbers attributable to each cause of mortality;

(c) all finfish sales from the aquaculture facility, including the number and destination of the finfish sold;

(d) the source and number of each group, lot or stock of finfish at the aquaculture facility; and

(e) each escape of finfish from the aquaculture facility.

(2) Holders must maintain a copy of the records required under this section at the finfish aquaculture facility for each lot of finfish until that lot of finfish is harvested or removed from the aquaculture facility.

Inspection and maintenance records

6 (1) For each finfish aquaculture facility of a holder, the holder must maintain accurate written records of the details of all inspections, maintenance and evaluation of all fish handling equipment, cage support systems and containment structures, including net cages and bag cages.

(2) Records of inspection, monitoring, evaluation and maintenance under this section in the case of a marine finfish aquaculture facility must be kept in a manner that complies with the requirements contained in the standards of practice in Appendix 2 of this regulation.

Training

7 (1) Holders must ensure that all finfish aquaculture facility staff are trained to conduct the business of aquaculture in a manner that prevents escapes and, if escapes occur, enables them to detect escapes and respond immediately and appropriately.

(2) In the case of a marine finfish aquaculture facility, training under this section must be conducted in a manner that complies with the requirements contained in the standards of practice in Appendix 2 of this regulation.

Record of drugs

8 (1) A holder must keep a record of a drug administered to the holder's finfish.

(2) For the purposes of this regulation the administration of a drug to a finfish includes the intentional introduction of a drug, or a substance containing a drug, into water in the holder's aquaculture facility.

(3) The record referred to in subsection (1) must include the following information:

(a) the aquaculture licence number and name of the holder;

(b) the location of the aquaculture facility;

(c) the species of finfish cultured and held;

(d) the name of the veterinarian who prescribed any drugs;

(e) a log

(i) naming the drugs,

(ii) specifying how the drugs were administered,

(iii) specifying the treatment schedule including the date treatment commenced,

(iv) specifying the date of the last treatment, and

(v) specifying the name and including the signature of the person responsible for administering each treatment.

(4) If a person delivers finfish from an aquaculture facility to a processing plant or to a fish buying station, the person must provide, at the time of delivery, a statement to the fish processing plant licensee or the fish buying station licensee, as the case may be, and the holder must retain a copy of this statement for one year.

(5) If a person delivers finfish from a fish buying station to a fish processing plant the person must provide, at the time of the delivery, the original or a copy of the statement referred to in subsection (4) to the fish processing plant licensee.

(6) A fish processing plant licensee who has received a statement under subsection (4) or (5) must retain a copy of the statement for one year.

(7) The statement referred to in subsection (4) must be signed by the person responsible for administering the treatment and by the holder or the holder's agent and must include the following information:

(a) the aquaculture licence number;

(b) the species of finfish;

(c) the date of harvest;

(d) the name of the fish processing plant to which the finfish are delivered;

(e) the quantity of finfish harvested;

(f) a lot number that identifies the shipment of finfish;

(g) the date of the most recent treatment, if any, with a drug or the final day of the withdrawal period for an administered drug, whichever is latest, including:

(i) the name of the drug,

(ii) the treatment schedule,

(iii) the dates treatment commenced and finished,

(iv) the prescribed withdrawal period,

(v) the name of the veterinarian, if any, who prescribed the drug, and

(vi) the name of the person responsible for administering the treatment.

Drug free period

9 A holder must not harvest finfish after administering a drug to the finfish unless:

(a) the *Food and Drugs Act* (Canada) or regulations made under that Act provide standards governing the use of the drug and the holder has complied with those standards, or

(b) the drug is prescribed by a veterinarian, the veterinarian has prescribed a mandatory period of time that must pass between the administration of the drug and the harvest of finfish and the holder has complied with all the veterinarian's instructions.

Prohibition against processing

10 (1) A person must not process finfish for sale in British Columbia except at an establishment that has a valid certificate of registration issued by the Department of Fisheries and Oceans (Canada).

(2) Subsection (1) does not apply to the packaging of finfish by a retailer for sale by the retailer.

(3) Subsection (1) does not apply if a person has the written consent of the minister to process finfish at an establishment with a valid processing licence.

Transportation

11 (1) A person who transports aquatic plants or fish on, over or through fresh or tidal waters must take reasonable precautions to prevent the escape of the plants or fish.

(2) A person who transports finfish must take all reasonable measures to control, mitigate, remedy or confine the effects of an escape of finfish.

Inspectors

12 (1) The minister may appoint a person as an aquaculture inspector to investigate matters related to

(a) the conduct of the business of aquaculture, and

(b) compliance with the Act, this regulation and an aquaculture licence and its conditions.

(2) An aquaculture inspector may enter an aquaculture facility during normal business hours to investigate the matters referred to in subsection (1) and a person must not obstruct the inspector in the course of the inspector's duties.

(3) At the request of an aquaculture inspector, an inspector of fisheries or a conservation officer, a holder or a person acting on a holder's behalf must produce for inspection any record or best management practice plan that is required to be kept under this regulation or as a term of an aquaculture licence, and

(a) a holder or person acting on behalf of a holder must produce for inspection any record or best management practice plan required to be kept under this regulation or a term of an aquaculture licence within 48 hours of a request by an aquaculture inspector, an inspector of fisheries or a conservation officer, and

(b) despite paragraph (a), a holder or a person acting on behalf of a holder must immediately produce for inspection any records or best management practice plan required to be kept at a finfish aquaculture facility by this regulation on request of an aquaculture inspector, an inspector of fisheries or a conservation officer who is present at the aquaculture facility.

(4) In the case of a marine finfish aquaculture facility, records or best management practice plans referred to in this section must include the records or best management practice plans required to be kept under Appendix 2 of this regulation.

(5) To establish that a net cage's mesh meets the minimum breaking strengths established in section 14 of Appendix 2, an aquaculture inspector, an inspector of fisheries or a conservation officer may apply one of the following procedures:

(a) review of the record of the most recent complete out-of-water servicing and inspection completed in accordance with section 18 of Appendix 2;

(b) require the holder to conduct an on-site test of the net in accordance with the protocol in section 15 of Appendix 2 while the net cage remains in the water at the marine finfish aquaculture facility;

(c) require the holder to remove the net cage from the water for a complete out-of-water servicing and inspection completed in accordance with section 18 of Appendix 2 within a timeframe established by the aquaculture inspector, the inspector of fisheries or the conservation officer.

Fees

13 A person applying for a new aquaculture licence, a renewal of an aquaculture licence or an amendment of an aquaculture licence must pay the fee for this set out in Appendix 1.

Appendix 1

1 In this Appendix:

"primary aquaculture product" means an aquatic plant or fish that is a product of aquaculture but does not include a processed or manufactured product;

"production value" means the dollar value of sales of a primary aquaculture product in the previous licence year, but, if the terms and conditions of the aquaculture licence for the previous licence year contain a maximum volume of production equivalent to a dollar value, it means that dollar value for that maximum volume of production.

2 The following schedule of fees applies for the purposes of section 13 of this regulation.

Schedule of Fees

(a) Application for initial licence..... $25

(b) Licence amendment..... $50

(c) Licence and licence renewal for

(i) aquaculture facility on private land, production value at least $7 500..... $100

(ii) aquaculture facility on private land, production value less than $7 500..... $50

(iii) aquaculture facility on Crown land, production value at least $7 500

(A) aquatic plants and fish other than finfish..... $50

(B) finfish..... $200

(iv) aquaculture facility on Crown land, production value less than $7 500

(A) aquatic plants and fish other than finfish..... $50

(B) finfish..... $100

Appendix 2

Standards of Practice for Marine Finfish Aquaculture Escape Prevention and Response

1 In this Appendix, **"spotter"** means a person trained and employed

(a) to watch for activity that indicates an increased risk of finfish escaping,

(b) to signal in a clear and predetermined manner for the activity to stop, and

(c) to take appropriate measures to stop the activity.

Part I — Equipment Design, Use and Maintenance

A — General Design and Maintenance

2 All equipment, materials and structures employed at a marine finfish aquaculture facility must be designed, constructed, installed, inspected and maintained in a manner that prevents escapes, including escapes caused by damage, holes or tears to net cages or containment structures through entanglements with other equipment.

3 Holders must monitor, evaluate and maintain containment structures, including cage support systems and net cages, in order to prevent escapes and to detect and respond to any escapes in a timely manner.

B — Containment Structures and Cage Support Systems

4 The requirements for containment structures are as follows:

(a) holders must ensure that equipment used at their marine finfish aquaculture facility is designed and constructed to meet generally accepted standards prevalent in the aquaculture industry;

(b) holders must evaluate new or experimental containment structure system designs through:

(i) field trials,

(ii) consultation with other aquaculture producers who have used the design,

(iii) comprehensive analysis of the manufacturer's performance trials, or

(iv) review by a professional engineer,

to ensure compatibility with conditions at the proposed location of the marine finfish aquaculture facility and with containment requirements;

(c) holders must ensure that containment structures are installed by a person who knows the risks of finfish escapement from the containment structures and the measures needed to minimize these risks;

(d) containment structures must be repaired or replaced with materials that meet or exceed the specifications approved in the holder's aquaculture licence.

5 The requirements for cage support systems are as follows:

(a) all cage support system weights and other equipment must be designed, constructed and installed with the aim of preventing entanglement and chafing with containment nets, predator nets and shark guard nets;

(b) all cage support system weights, anchoring equipment, and other equipment that has the potential to come into physical contact with the net cage must be maintained to prevent catching or abrading nets;

(c) daily above-water visual inspections of active cage support systems including, anchoring-line buoy orientation and the general integrity of the anchoring system must be conducted at all marine finfish aquaculture facilities;

(d) any irregularity noted in paragraph (c) that increases the risk of escape must be corrected or repaired immediately;

(e) a record of the daily visual inspection and any repairs under this section must be made and a copy of the record must be retained at the marine finfish aquaculture facility for one year.

6 The requirements for anchoring equipment are as follows:

(a) anchoring equipment design must be compatible with the containment structure equipment and biophysical conditions of the location;

(b) anchoring equipment must be repaired or replaced with materials that meet or exceed specifications approved in the holder's aquaculture licence.

C — Net Cages

I — Design, Installation and Maintenance

7 A net cage that does not have a permanently attached mesh top must be attached by the water line rope of the net cage to the cage support system as a primary point of attachment and any attachment of net cages to the cage support system railing must be only for support of the jump net.

8 Jump nets extending at least one metre above the surface of the water must be installed at the top of any net cage that does not have a permanently attached mesh top or similar barrier.

9 Sufficient weight or pressure must be used to produce tension on net cage panels with the aim of

maintaining a taut net.

10 Net cages must be weighted at a sufficient number of points to ensure the tension or weight is distributed evenly.

11 Netting mesh size must be small enough to contain the smallest fish to be placed in the net cage.

12 Net cages must be stored in a manner that minimizes deterioration of the net material.

13 Holders must ensure that all tears found while handling or inspecting net cages in use or intended for use at any time are repaired immediately.

II — Net Cage Mesh Strength

14 According to the dimension classification identified in Table 1, the mesh of any part of a net cage, including any repairs, must meet the minimum breaking strength standards established in Tables 2 through 6.

Table 1: Net Cage Dimension Classification

Perimeter	Up to 50 m (164 ft.)	> 50 m to 60 m (197 ft.)	> 60 m to 70 m (230 ft.)	> 70 m to 80 m (262 ft.)	> 80 m to 90 m (295 ft.)	> 90 m to 110 m (361 ft.)
Depth						
Up to 5 m (16 ft.)	A	A	B	C	D	D
>5 m to 10 m (33 ft.)	A	A	B	C	D	D
>10 m to 15 m (49 ft.)	A	B	B	C	D	D
>15 m to 20 m (66 ft.)	B	B	C	D	D	D
>20 m to 30 m (98 ft.)	D	D	D	D	D	E
>30 m	E	E	E	E	E	E

A to E establishes net cage dimension classification. Depth is from waterline rope to net cage bottom. Perimeter refers to the line bounding the top of the net cage.

Table 2: Dimension Classification A

Mesh Size	Minimum Required Mesh Breaking Strength (below surface of water)	Minimum Required Mesh Breaking Strength (jump netting, above surface of water)
< 22 mm (7/8")	20 kg (44 lbs)	18 kg (41 lbs)
> 22 mm (7/8") to < 38 mm (1-1/2")	26 kg (58 lbs)	24 kg (52 lbs)
38 mm (1-1/2")	31 kg (68 lbs)	28 kg (62 lbs)

> 38 mm (1-1/2")	41 kg (90 lbs)	38 kg (83 lbs)

Table 3: Dimension Classification B

Mesh Size	Minimum Required Mesh Breaking Strength (below surface of water)	Minimum Required Mesh Breaking Strength (jump netting, above surface of water)
< 22 mm (7/8")	25 kg (56 lbs)	24 kg (52 lbs)
> 22 mm (7/8") to < 38 mm (1-1/2")	31 kg (68 lbs)	28 kg (62 lbs)
38 mm (1-1/2")	41 kg (90 lbs)	38 kg (83 lbs)
> 38 mm (1-1/2")	46 kg (102 lbs)	43 kg (94 lbs)

Table 4: Dimension Classification C

Mesh Size	Minimum Required Mesh Breaking Strength (below surface of water)	Minimum Required Mesh Breaking Strength (jump netting, above surface of water)
< 38 mm (1-1/2")	36 kg (79 lbs)	33 kg (73 lbs)
38 mm (1-1/2")	46 kg (102 lbs)	43 kg (94 lbs)
> 38 mm (1-1/2")	51 kg (113 lbs)	47 kg (104 lbs)

Table 5: Dimension Classification D

Mesh Size	Minimum Required Mesh Breaking Strength (below surface of water)	Minimum Required Mesh Breaking Strength (jump netting, above surface of water)
< 38 mm (1-1/2")	41 kg (90 lbs)	38 kg (83 lbs)
38 mm (1-1/2")	51 kg (113 lbs)	47 kg (104 lbs)
> 38 mm (1-1/2")	62 kg (136 lbs)	57 kg (125 lbs)

Table 6: Dimension Class E

Mesh Size	Minimum Required Mesh Breaking Strength (below surface of water)	Minimum Required Mesh Breaking Strength (jump netting, above surface of water)
< 38 mm (1-1/2")	46 kg (102 lbs)	43 kg (94 lbs)
38 mm (1-1/2")	62 kg (136 lbs)	57 kg (125 lbs)
> 38 mm (1-	77 kg (169 lbs)	71 kg (156 lbs)

1/2")		

15 Tests to determine the net cage mesh breaking strengths of a net cage's mesh as established in section 14 of this Appendix must be conducted in accordance with the protocol set out in the British Columbia Net Cage Mesh Strength Testing Procedure, Version 1, a copy of which may be obtained from the manager or an aquaculture inspector.

16 At the request of an aquaculture inspector, an inspector of fisheries or a conservation officer, holders must demonstrate that net cage mesh meets minimum breaking strengths established in section 14 of this Appendix, within a period of time determined by the inspector or conservation officer.

17 Net cages with mesh that does not pass the breaking strength test requirements established in section 14 of this Appendix must be repaired or retired as soon as possible.

III — Inspections and Record Keeping

18 The requirements for complete out-of-water servicing and inspection of net cages are as follows:

(a) servicing and inspections must be carried out by a person who knows the risks of finfish escapement from the net cages and the measures needed to minimize these risks;

(b) a complete visual inspection of the entire net cage must be completed for signs of abrasions, tears or holes;

(c) any damage to the net cage must be repaired as needed;

(d) the net cage mesh must be tested in accordance with the protocol in section 15 of this Appendix;

(e) a record of testing must be completed in accordance with the protocol in section 15 of this Appendix;

(f) the record of testing must be signed by the person who carried out the inspection.

19 (1) In this section, **"comparable method"** means a method of inspection designated in writing by the manager to be equivalent to inspection by divers for purposes of this section.

(2) Holders must ensure that complete inspection and repair of active net cages and any similar structure that contains fish at their marine finfish aquaculture facilities takes place as follows:

(a) an underwater inspection, by divers or other comparable method must be conducted on any net cages or any similar structure used to contain fish prior to the initial introduction of a new group of fish;

(b) active net cages and similar structures used to contain fish must be inspected every 60 days by divers or another comparable method;

(c) despite paragraph (b), active net cages and any similar structure used to contain fish must be inspected as soon as is practicable by divers or another comparable method after any operational activity or event that increases risk of net failure, including extreme environmental conditions, net cage changes, fish delivery, recurring predator attacks, vandalism to net cages

or equipment or towing of active containment structures;

(d) despite paragraph (b), active net cages and any similar structure used to contain fish must be inspected by divers or another comparable method as soon as is practicable after any event that occurs during routine harvesting, grading or any other routine activity which leads a holder or person acting on their behalf to suspect there is a material increase in the risk of net failure.

20 Each net cage must be marked with an inventory control number that is permanently marked on a permanent tag attached at the top of the net cage within one metre of a corner down line or a main down line of a circular net cage.

21 At the marine finfish aquaculture facility where the net cage is deployed, holders must have a written maintenance record for each net cage that includes

(a) the inventory control number referred to in section 20 of this Appendix,

(b) the dimensions,

(c) the mesh size,

(d) a record of the most recent complete out-of-water servicing and inspection under section 18 of this Appendix,

(e) the accumulated time-in-water since the most recent complete out-of-water servicing and inspection under section 18 of this Appendix,

(f) a description and the dates of each inspection under section 19 of this Appendix since most recent complete out-of water servicing and inspection under section 18 of this Appendix, and

(g) a description and the dates of all repairs, including reasons for repairs, made to the net cage since the most recent complete out-of-water servicing and inspection under section 18 of this Appendix.

22 Records required to be kept under section 19 and 21 of this Appendix that were recorded prior to the last out-of-water servicing and inspection under section 18 of this Appendix must be retained for six months after that out-of-water servicing and inspection.

23 Holders must have written records for each net cage that includes

(a) the inventory control number in section 20 of this Appendix,

(b) the manufacturer's name,

(c) the year produced,

(d) the dates and records of all complete out-of-water servicings and inspections since October 31, 2000, under section 18 of this Appendix, and

(e) if applicable, the date of retirement.

24 Records for each net cage under section 23 of this Appendix must be retained for 1 year

following retirement of the net cage.

Part II — Operations

A — Boat Operations

25 Holders must ensure that all boats in use at their marine finfish aquaculture facilities are operated so as to prevent damage to containment structures and anchoring systems.

26 Holders must designate a docking site for boats not involved in the cultivation of fish.

27 Holders must ensure that signs are posted on the containment system to direct boats not involved in the cultivation of fish to designated docking sites.

28 Designated boat docking sites must be designed and located to prevent propeller damage to net cages.

29 Large vessels must not be moored to cage support system rails or stanchions.

B — Key Operational Activities

30 Equipment and practices related to boat operations, fish feeding, fish handling, mortality recovery, smolt delivery, grading, harvesting, towing of active net pens and other activities must be designed and conducted in a manner that prevents the escape of fish.

31 Spotters must be used to visually monitor and prevent damage to net cages, ropes and cage support systems during all fish handling activities, including when a large vessel is operating in the vicinity of active net cages.

32 Catch nets must be used to prevent escapes due to human error, equipment failure, or fish jumping out of the equipment while holders are transporting, harvesting, grading, sampling and moving live finfish outside of net cages.

33 If a pattern of predator attacks is established and resulting mortalities are experienced at a marine finfish aquaculture facility, holders must initiate measures to prevent containment structure damage and collateral stock escape.

C — Best Management Practices Plan

34 (1) Holders must develop and follow a best management practices plan for the operation and maintenance of their marine finfish aquaculture facilities, within 180 days of the proclamation of this regulation, which is consistent with the Standards of Practice in Appendix 2 of this regulation and with the objective of preventing escapes of finfish to the environment as a result of the following activities:

(a) finfish delivery, handling, grading and harvesting;

(b) net cage and bag cage changing;

(c) boat operations and maintenance;

(d) towing of active containment structures at, to or from the marine finfish aquaculture

facility;

(e) management of predation of farm stock;

(f) recovery of mortalities.

(2) The best management practices plan must include

(a) a description of specific management practices and standard operating procedures used to achieve the above objectives,

(b) a statement that the best management practices plan has been reviewed and endorsed by the holder, and

(c) a statement that individuals responsible for implementation of the plan understand and have received training in the plan.

(3) Holders must:

(a) maintain a copy of the best management practices plan at the marine finfish aquaculture facility and make the plan available upon the request of the manager of aquaculture, an aquaculture inspector, an inspector of fisheries or a conservation officer,

(b) amend the best management practices plan in a timely fashion whenever there is a change in the operation of the marine finfish aquaculture facility that materially increases the risk of escape of finfish to the environment,

(c) review any changes in the operation of the marine finfish aquaculture facility and ensure that changes are consistent with best management practices plan objectives, and

(d) if the manager provides a written opinion that a best management practices plan is ineffective in achieving the objectives in subsection (1), revise the best management practices plan and incorporate those revisions as needed in a timely fashion, to ensure the objectives are met.

Part III — Escape Response Plans

35 Every holder must have a written escape response plan.

36 Holders must ensure that their escape response plans are posted in visible locations at their marine finfish aquaculture facilities and that the locations and contents of the posted plans are made known to all staff.

37 Holders' escape response plans must include step-by-step procedures for preventing further escapes and for reporting escapes.

38 After an escape or suspected escape, holders must ensure that immediate corrective action is taken to prevent further escapes and the escape response plan is fully executed.

39 On the escape of finfish from an aquaculture facility, the holder must take all reasonable measures consistent with federal, British Columbia and local government enactments that

(a) will result in the recapture of a significant portion of the lost stock, and

(b) will not detrimentally impact on wild stocks.

40 Holders must ensure that their escape response plans include arrangements in place with federal, British Columbia and local government authorities to obtain without delay the approvals necessary for the purposes of section 39 of this Appendix.

Note: this regulation replaces B.C. Reg. 364/89

[Provisions of the *Fisheries Act*, R.S.B.C. 1996, c. 149, relevant to the enactment of this regulation: section 26]

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BRITISH COLUMBIA

MINISTRY OF AGRICULTURE, FOOD AND FISHERIES
FINFISH AQUACULTURE SITE INSPECTION CHECKLIST

1. OPERATION DESCRIPTION

Incident Number: _____

Company Name: _____ Location: _____

Site Name: _____ Aquaculture Licence Number: _____

Inspection Date and Time: _____

Person(s) Interviewed: _____

Inspection Completed by: _____

General Comments: _____

2. TERMS AND CONDITIONS

MANAGEMENT PLAN		OBSERVED ON SITE		
Species	**Biomass**	**Species**	**Piece Count**	**Biomass**
Total				

Comments: _____

Containment Structures

MANAGEMENT PLAN			OBSERVED ON SITE			
Structure	**Size**	**Total Number**	**Structure**	**Size**	**Total Number**	**Number in Use**

Comments: _____

2.2 AQUACULTURE LICENCE

Is the aquaculture licence current? YES ☐ NO ☐

s. 13 of Fisheries Act, s. 2 of Aquaculture Reg.

Checklist Section
Specific Questions & Relevant Section of Aquaculture Regulation
WRITTEN RECORDS

STATUS

3. ESCAPE REPORTS

- During the last 12 months has the farm detected any escapes or possible escapes? YES ☐ NO ☐

If yes, was the escape reported to the Manager of Aquaculture? **s. 4(1)** YES ☐ NO ☐

- Provide details of most recent escape event (date, species, number, cause, year stocked, average weight, rearing facility, record of each drug): **s. 4(2)** _____

_____

_____

4. INVENTORY RECORDS (CONTAINMENT STRUCTURES)

- Are the required inventory records kept for each containment structure? (fish in, fish out, mortalities, escapes and source of fish) **s. 5(1)** YES ☐ NO ☐
- Are the above inventory records kept on site? **s. 5(2)** YES ☐ NO ☐

5. INSPECTION RECORDS

- Are daily above-water visual inspections of cage support systems done? **s. A5(c)** YES ☐ NO ☐
- Are these daily visual inspections recorded in a written record kept on site? **s. A5(e)** YES ☐ NO ☐
- Are written records maintained of all complete net cage inspections (by divers or other approved methods)? **s.6(1)** YES ☐ NO ☐

  (Hole check dives are required after extreme environmental conditions, net changes, fish delivery, recurring predator attacks, vandalism, towing of active pens and other activities that increase the risk of net failure)**s. A19 (2) (c)**
- Are the required net cage maintenance records kept on site: **s. A21** YES ☐ NO ☐

  (on site net records required are inventory control number dimensions, mesh size, record of last out-of-water service, accumulated time-in-water, description and date of each inspection since the last out-of-water service and the date, description and reason for all repairs made since the last out-of-water servicing or inspection)

6. BEST MANAGEMENT PRACTICES PLAN (BMP)

- Does the Company have a BMP on site? **s. A34(1)** YES ☐ NO ☐
- Is the BMP complete? YES ☐ NO ☐

  (The BMP should include the following activities: fish delivery, handling and harvesting; net cage and bag changing; boat operation; towing of active containment structures; management of predators and recovery of mortalities)

  Comments on BMP _____

_____

- Is further investigation of BMP required to ensure the BMP meets escape prevention objectives? **s. A34(3) (d)** YES ☐ NO ☐
- Does the BMP plan include a statement that the plan has been reviewed and endorsed by the holder? **s. A34(2)(b)** YES ☐ NO ☐

7. ESCAPE RESPONSE

- Does the holder have a written Escape Response Plan posted in a visible location? **s. 35** YES ☐ NO ☐
- Are arrangements in place with federal, provincial and local government authorities to obtain necessary approvals for recapturing escaped fish? **s. A40** YES ☐ NO ☐

8. THERAPEUTANT USE & RECORDS (not required on site)

- Are treatments currently being administered? YES ☐ NO ☐
  a) If yes, are the treated groups identified? YES ☐ NO ☐
  b) If no, indicate date of last treatment: _____
- For current or last treatment indicate: **s. 8(7)(g)**
  a) name of therapeutant: _____ N/A ☐
  b) name of prescribing veterinarian: _____ N/A ☐
  c) anticipated withdrawal time: _____ N/A ☐
- Are drug administration records kept. **s. 8(3)** YES ☐ NO ☐

If fish are being harvested has the holder completed a form pursuant to **s. 8(4)** and **8(7)** YES ☐ NO ☐

9. NET CAGE INSPECTIONS

- Is the water line rope the primary point of attachment of the net cage to the cage support system (for cages without a permanently attached mesh top)? **S. A7** YES ☐ NO ☐
- Does the jump net extend at least 1 metre above the water line (for cages without a permanently attached mesh top)? **s. A8** YES ☐ NO ☐
- Is sufficient weight or pressure used to produce tension on net panels in order to maintain a taut net? **s. A9** YES ☐ NO ☐
- Are net cages weighted at a sufficient number of points to ensure the tension or weight is distributed evenly? **s. A10** YES ☐ NO ☐
- Are tears found in nets that are in use or intended for use repaired immediately? **s. A13** YES ☐ NO ☐
- How are complete inspections of active net cages done? (i.e. diver or other method) _____

- Are underwater inspections completed before a new group of fish is introduced? **s. A19 (2)(a)** YES ☐ NO ☐
- Are complete inspections done on active net cages at least every 60 days (by divers or an approved comparable method)? **s. A19(2)(b)** YES ☐ NO ☐
- Are all containment structures inspected after events that could increase the risk of escape? **s. A19(2)(c)** YES ☐ NO ☐

  (Activities that increase risk of escape are extreme weather, net changes, fish delivery, recurring predator attacks, vandalism, towing containment structures.)
- Are all net cages permanently marked with an inventory control number? **s. A20** YES ☐ NO ☐

10. BOAT DOCKING

- Is there a designated docking site for boats not involved in fish cultivation? **s. A26** YES ☐ NO ☐
- Are signs posted on the containment system to direct boats to this site? **s. A27** YES ☐ NO ☐
- Are these sites designed and located to prevent propeller damage to net cages? **s. A28** YES ☐ NO ☐
- Are any large vessels moored to cage support system rails or stanchions? **s. A29** YES ☐ NO ☐

11. FISH HANDLING

If fish handling is occurring, is the company using the following:

a) Spotters during fish handling activities or when a large vessel is operating nearby? **s. A31** YES ☐ NO ☐

b) Catch nets when transporting, harvesting, grading, sampling and moving live fish outside of net cages? **s. A32** YES ☐ NO ☐

12. PREDATOR CONTROL

If a pattern of predator attack has been established, has the operator of the site implemented measures to prevent loss of stock and containment structure damage? **s. A33** YES ☐ NO ☐

13. BIOSECURITY PROCEDURES (for information only)

- Are there multiple year classes on site? YES ☐ NO ☐

If yes, are classes separated? YES ☐ NO ☐

ADDITIONAL COMMENTS/OBSERVATIONS _____

_____

_____

_____

_____

BRITISH COLUMBIA

MINISTRY OF WATER, LAND AND AIR PROTECTION
FINFISH AQUACULTURE SITE INSPECTION CHECKLIST

OPERATION DESCRIPTION

Incident Number: _____

Company Name: _____ Location: _____

Site Name: _____ Aquaculture Licence Number: _____

Inspection Date and Time: _____

Person(s) Interviewed: _____

Inspection Completed by: _____

General Comments: _____

A. REGISTRATION (Section 3)

- Has the site been registered? YES ☐ NO ☐
- If no, has the site been stocked since Dec 11, 2002? YES ☐ NO ☐

B. BEST MANAGEMENT PRACTICES (Section 8)

- Is there a copy of the BMP available at the facility? YES ☐ NO ☐
- Does the BMP identify as an objective compliance with requirements in Sections 5 and 6, and the standards in Section 4? (Standards for soft bottoms) YES ☐ NO ☐
- Does the BMP document show plans for continual reduction in discharges or reduction in number or quantity of potential sources of discharges? YES ☐ NO ☐
- Has the BMP been reviewed by the staff at the facility? YES ☐ NO ☐
- Does the BMP included a fish kill contingency plan? YES ☐ NO ☐
  - Does the plan identify normal mort recovery thresholds? YES ☐ NO ☐
  - Does the plan provide contact phone numbers? YES ☐ NO ☐
  - Does the plan consider logistics up to total loss of fish? YES ☐ NO ☐
- Does the BMP provide information to meet the following objectives:
  - Compliance with monitoring and reporting? YES ☐ NO ☐
  - Continual reduction of number and quantity of wastes? YES ☐ NO ☐
  - Continual improvement in feed conversion ratio? YES ☐ NO ☐
  - Prevention of spillage of feed? YES ☐ NO ☐
  - Prevention of attraction/access of wildlife to feed? YES ☐ NO ☐
  - Prevention of access by wildlife to containment structures? YES ☐ NO ☐
- Does the BMP contain a list of potentially harmful materials? YES ☐ NO ☐

BLOODWATER DISPOSAL

- Are fish live hauled to a processing plant? YES ☐ NO ☐

If yes, list species: _____

If no, is blood water disposed at the processing plant? YES ☐ NO ☐

Waste Management Act, s. 3 (2)

If no, please explain treatment prior to discharge, and volume and location of discharge: _____

NET TREATMENT, CLEANING AND WASTE DISPOSAL

- Are treated nets utilized at the farm? YES ☐ NO ☐
- Are nets cleaned at an upland site? YES ☐ NO ☐

Provide company, location and frequency. _____

DISINFECTANT USE AND DISPOSAL

- Are disinfectants used on site? YES ☐ NO ☐
  - a) If yes, list types and purposes of use. _____
  - b) How and where are disinfectants stored during use? _____
- How are used disinfectants disposed?
- Are disinfectants treated prior to disposal? YES ☐ NO ☐

If yes, explain. _____

MORT STORAGE AND DISPOSAL

- How are morts stored on site prior to disposal? _____
- What is the frequency of removal? _____
- Was any mort spillage observed? YES ☐ NO ☐

If yes, explain location and volume. _____

- Are morts disposed on site? YES ☐ NO ☐

If yes, explain method and authority. _____

If no, provide method and name of disposal company. _____

REFUSE STORAGE AND DISPOSAL

- How is refuse stored on site prior to disposal? _____
- Is refuse disposed on site? YES ☐ NO ☐

If yes, explain location and method. _____

If no, state the disposal location.

FUEL/PRODUCT USE, STORAGE AND CONTAINMENT

- Are diesel tanks protected with adequate containment? YES ☐ NO ☐
  BC Fire Code 4.3.7.3
- Is the generator set protected with adequate containment? YES ☐ NO ☐
- Are fuels/products (therapeutants, anesthetics) securely stored and protected from environment? YES ☐ NO ☐

If no, explain insecure storage. _____

_____

C. SEWAGE TREATMENT AND DISPOSAL (Section 7)

- Is there a washroom facility within the fish farm structure? YES ☐ NO ☐
- Is sewage treated via septic tank with 48 hour retention or another authorized method? YES ☐ NO ☐

If no, explain treatment. _____

- Is sewage discharged via a 15 metre pipe below water? YES ☐ NO ☐

If no, explain discharge. _____

- Are sewage inspection/maintenance/construction records maintained? YES ☐ NO ☐

D. ENVIRONMENTAL MANAGEMENT

- Is adequate spill equipment on site? YES ☐ NO ☐
- Is a spill contingency plan available on site? YES ☐ NO ☐
- Is the Spill Reporting Number (1-800-663-3456) posted on site? YES ☐ NO ☐
- Are methods utilized to minimize overfeeding? YES ☐ NO ☐

If yes, explain methods. _____

_____

E. WATER USE AND LICENCING

- What is the source of fresh water? _____
- What purpose does this farm use water? _____
- If lake or stream water is utilized, is there a water licence? YES ☐ NO ☐
  Water Act, s. 41 (1)(p)

If yes, provide licence number or date of application and file number. _____

_____

F. WILDLIFE PREDATOR TRAPPING

- Have wildlife (otters, mink) been trapped over the last year? YES ☐ NO ☐
  Wildlife Act, s. 11(8)
  a) If yes, name the trapper and licence number. _____
  b) List the type and number of species trapped. _____
  c) Are the species live trapped? YES ☐ NO ☐

G. WILDLIFE HUNTING

- Are firearms stored on site for purpose of personal use/hunting? YES ☐ NO ☐
  Wildlife Act, s. 11(1)(a)(i)

If yes, list responsible person and provincial hunting licence number. _____

_____

ADDITIONAL COMMENTS/OBSERVATIONS _____

_____

_____

_____

_____

_____

_____

BRITISH COLUMBIA

SITE INSPECTION COMPLIANCE REPORT – WLAP Regulatory Issues

Inspection Section	Compliant*	Inspection Section	Compliant*
A. Registration	Yes ☐ No ☐	f) Minimum 110% containment of fuel	Yes ☐ No ☐
B. Best Management Practices	Yes ☐ No ☐	C. a) Treatment of Sewage	Yes ☐ No ☐
a) Disposal of Blood Water	Yes ☐ No ☐	b) Disposal of Sewage	Yes ☐ No ☐
b) Disposal of Net Cleaning Waste	Yes ☐ No ☐	D. Environmental Management	Yes ☐ No ☐
c) Disposal of Disinfectant Waste	Yes ☐ No ☐	E. Water Licence	Yes ☐ No ☐
d) Disposal of Morts	Yes ☐ No ☐	F. Trapping Licence	Yes ☐ No ☐
e) Disposal of Refuse	Yes ☐ No ☐	G. Hunting Licence	Yes ☐ No ☐

Company Name _____

Site Name _____

Person Interviewed _____

Signature _____

MAFF Inspector _____

Date of Inspection _____

***IF NOT IN COMPLIANCE, SEE BELOW FOR DETAILS**

Inspection Section (above)	Legislation Contravened	Required Corrective Measures	Date Action to be Completed	Date of Required Response to Ministry

Service of this notice does not preclude the ministry from pursuing prosecution and/or administration action for the above-listed non-compliance issues.

Other Non-Compliance observed: _____

Signature of Inspector: _____

Date of Chief Inspector Review: _____

Date Forwarded to Head Office: _____

Date Forwarded to MWLAP: _____

Number of Sites Inspected per Company

Company Name	MAFF Inspections	Inspections that included a review of MWLAP regulatory issues:
Hardy Sea Farms Inc.	7	
Stolt Sea Farm Inc.	13	11
Ewos Aquaculture Ltd.	8	
Omega Salmon Group Ltd.	18	1
Totem Oysters Ltd.	1	
Saltstream Engineering Ltd.	1	
Connors Bros. Ltd. (Heritage)	11	7
Nutreco Canada Inc.	15	1
Sonora Sea Farm Ltd.	1	
Creative Salmon Company Ltd.	4	4
Grieg Seafood BC Ltd.	4	
Omega Pacific Seafarms Inc.	1	
Yellow Island Aquaculture (1994) Ltd.	1	
Totals:	**85**	**24**

Summary of Record-Keeping Requirements for Marine Commercial Finfish Aquaculture Facilities in British Columbia

This document summarizes select portions of the *Aquaculture Regulation* (78/02) under the provincial *Fisheries Act*. This document is not a legal authority and in no event will the Province be liable or responsible for damages of any kind arising out of the use of this summary. Persons who need to rely on the text of the regulation for legal and other purposes should obtain the official printed version.

Type of Record	Specific Area	Contents of record	Retention Time	Location of record	Availability to an aquaculture inspector	Relevant section of regulation
FISH	Inventory	For each containment structure (net cage, bag type, etc.), licence holders must maintain accurate written records of: • the transport, transfer and introduction of fish into or away from the facility • the weekly fish mortalities, including the causes and the numbers attributable to each cause • all fish sales from the facility, including number and destination of fish sold • the source and number of each group/lot/stock of fish at the facility • each escape of fish from the facility	Unspecified. Holders should maintain records for a reasonable period of time Records should be available at the facility until the lot of finfish is harvested or removed from the facility	At the facility until the lot of finfish is harvested or removed from the facility Unspecified after fish are harvested or removed from the facility	Within 48 hrs upon request; immediately upon request by an inspector who is at the facility	s. 5(1)- 5(2)
	Drugs	Licence holders must keep a record of the following information for a drug administered to the holder's fish: • aquaculture licence number, name of licence holder, location of facility • species of fish cultured/held • name of the veterinarian who prescribed any drugs • a log that: names any drugs, specifies how drugs were administered, specifies the treatment schedule including the date treatment commenced and ended, names and includes the signature of the person responsible for administering each treatment.	Unspecified. Holders should maintain records for a reasonable period of time	Unspecified	Within 48 hrs upon request	s. 8(1)- 8(3)
	Harvests	Provide a statement to a fish processing plant or buying station to which fish are delivered from the facility, at the time of delivery. This statement must include the: • signature of the licence holder (or the licence holder's agent) and signature of the person responsible for administering the drug treatment discussed below. • aquaculture licence number	1yr by holder and 1yr by plant/ station licensee	Unspecified	Within 48 hrs upon request	s. 8(4)- 8(7)

Summary of Record-Keeping Requirements for Marine Commercial Finfish Aquaculture Facilities in British Columbia

FISH	Harvests (continued)	• species of fish • date of harvest • name of processing plant or buying station the fish were delivered to • quantity of fish harvested • a lot number that identifies the shipment of fish • date and record of most recent drug treatment, if any, with a drug or date of the final day of the withdrawal period for an administered drug (whichever is latest). This should include the name of the drug, treatment schedule, the dates treatment commenced and finished, the prescribed withdrawal period, name of veterinarian (if any) who prescribed the drug, and the name and signature of the person responsible for administering the treatment	1yr by holder and 1yr by plant/ station licensee	Unspecified	Within 48 hrs upon request	s. 8(4)- 8(7)
EQUIPMENT	Cage Support System	Record of daily visual inspections and repairs of the cage support system	1 year from date of daily visual inspection	At the facility	Within 48 hrs upon request; immediately upon request by an inspector who is at the facility	s. 6(1) Appendix 2, s.5(e)
EQUIPMENT	Net Cages: *regular maintenance*	Licence holders must have a written maintenance record *for each net cage deployed* which includes: • the inventory control number (see Appendix 2, section 20 for specifications on tagging each net cage) • dimensions and mesh size • record of most recent complete out-of-water servicing and inspection (see Appendix 2, section 18 for complete requirements for this servicing and inspection) ➢ when cage net mesh is tested as part of a complete out-of-water servicing and inspection, the person who carries out this servicing and inspection must complete and sign a net testing record (specific details of this requirement can be found in the "British Columbia Net Cage Mesh Strength Testing Procedure, Version 1") • the accumulated time in water since most recent complete out-of-water servicing and inspection • a description and the dates of each inspection (by divers or other comparable method) since the most recent complete out-of-water servicing and inspection • a description, the dates and reasons for all repairs made since most recent complete out-of-water servicing and inspection	6 months after the most recent complete out-of-water servicing and inspection	At the facility	Within 48 hrs upon request; immediately upon request by an inspector who is at the facility	s. 6(1) Appendix 2, s.18-21 "British Columbia Net Cage Mesh Strength Testing Procedure, Version 1"

Summary of Record-Keeping Requirements for Marine Commercial Finfish Aquaculture Facilities in British Columbia

EQUIPMENT	Net Cages: *life history*	Licence holders must have a written record for each net cage that includes: • the inventory control number (see Appendix 2, section 20 for specifications on tagging each net cage) • manufacturer's name • year produced • dates and records of all complete out-of-water servicing and inspections since October 31, 2000 • date of retirement (if applicable)	1 year following retirement of net	Unspecified	Within 48 hrs upon request	s. 6(1) Appendix 2, s. 23-24
STAFF PRACTICES	Best Management Practices (BMP) Plans	Licence holders must maintain a copy of a BMP plan at the facility; this plan must include: • a description of specific practices and procedures used to achieve the escape prevention objectives in Section 34(1) • a statement that the plan has been reviewed and endorsed by the licence holder • a statement that individuals responsible for implementation of the plan understand and have received training in the plan Note: Other government policies and regulations may require submission of information in a BMP plan format; however the above requirements refer only to BMP plans prescribed under the *Aquaculture Regulation* (78/02)	Always	At the facility	Within 48 hrs upon request; immediately upon request by an inspector who is at the facility	Appendix 2, s. 34
	Escape Response Plans	Licence holders must have a written escape response plan; plans must be posted in visible locations at their aquaculture facilities; contents and locations of plans must be made known to all staff.	Always	At the facility	Within 48 hrs upon request; immediately upon request by an inspector who is at the facility	Appendix 2, s. 35

NOTE:
A licence holder must produce for inspection any record or Best Management Practices plan required to be kept under this regulation within 48 hours of a request by a provincial aquaculture inspector. Records that are required under this regulation to be kept at the facility must be provided immediately upon request by an inspector who is at the facility. An inspector may enter the facility any time during normal business hours (see section 12(3) of the *Aquaculture Regulation* for details).

SUMMARY OF MARINE ESCAPE REPORTS:

The factors contributing to escapes can be roughly divided into six general categories:

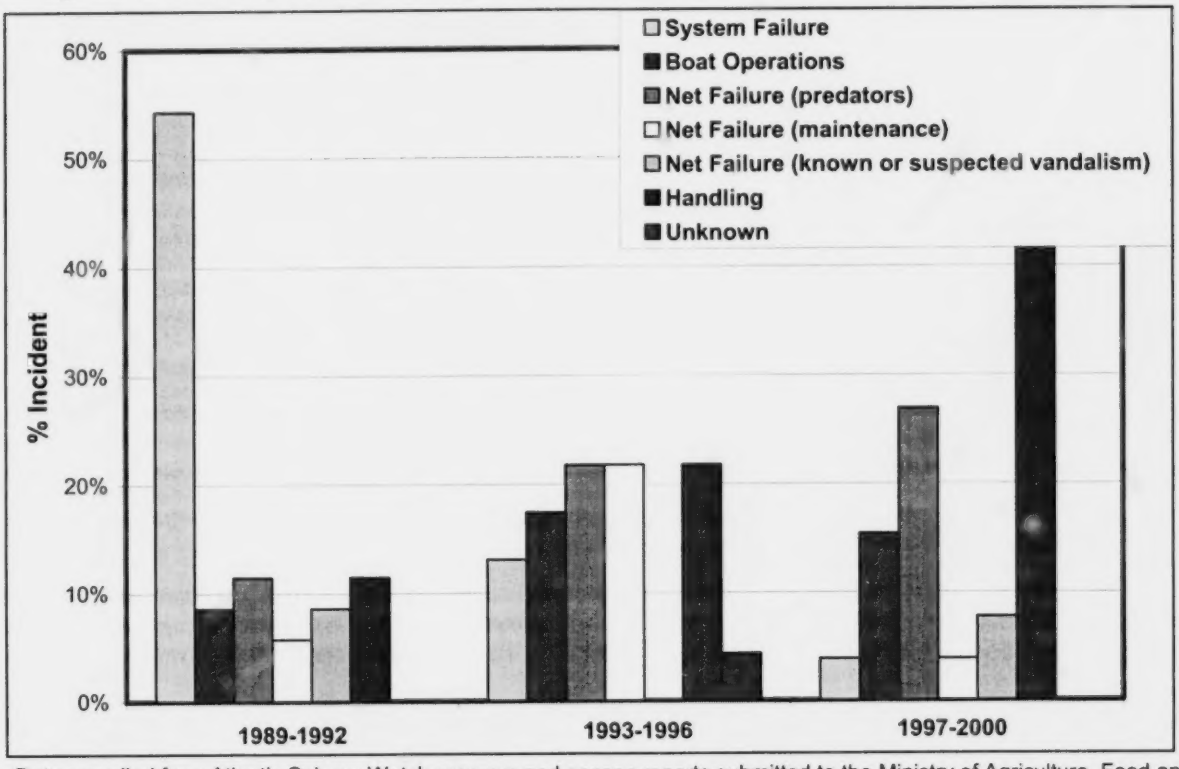
1. **System Failure:** failure of containment structures or anchoring systems that result from a technological failure not related to nets, generally of a catastrophic nature. Can most often be attributed to extreme weather or ecological events (i.e. floods). This cause of escape has declined dramatically over the last decade and no major escapes (over 10,000 fish) have resulted from system failure in the last seven years.
2. **Boat Operations:** net tears or infrastructure damage resulting from propeller or whole boat collisions with the net pen system.
3. **Net Failure (predators):** net tears resulting from seal, sea lion or dogfish attacks.
4. **Net Failure (maintenance)**: net tears resulting from poor or inadequate maintenance such as chafing of nets due to contact with abrasive equipment, failure to repair small holes, deterioration of nets with age, failure to remove dead fish or debris, etc.
5. **Net Failure (known or suspected vandalism)**: fish loss resulting from a suspected or known vandalism incident.
6. **Handling:** fish loss that results during fish handling events such as fish transfer, net changes, towing, sorting, grading, harvesting, etc and is not related to failure of the integrity of a net-pen or containment structure. This type of escape can generally be directly attributed to human error.

Table 1: Summary of Causes of Reported Marine Escapes Between 1989 and 2000.

Cause	1989-1992			1993-1996			1997-2000		
	% incident	# incident	% pieces	% incident	# incident	% pieces	% incident	# incident	% pieces
1. System Failure	54.3%	19	70.7%	13.0%	3	20.2%	3.8%	1	3.3%
2. Boat Operations	8.6%	3	2.8%	17.4%	4	10.1%	15.4%	4	15.4%
3. Net Failure (predators)	11.4%	4	1.6%	21.7%	5	25.7%	26.9%	7	8.2%
4. Net Failure (maintenance)	5.7%	2	2.8%	21.7%	5	31.9%	3.8%	1	13.2%
5. Net Failure (known or suspected vandalism)	8.6%	3	19.2%	0.0%	0	0.0%	7.7%	2	32.2%
6. Handling	11.4%	4	2.9%	21.7%	5	7.0%	42.3%	11	27.7%
7. Unknown	0.0%	0.0%	0.0%	4.3%	1	5.1%	0.0%	0.0%	0.0%
Total incidents		**35**			**23**			**26**	
Average Pieces			**215123**			**39561**			**60424**

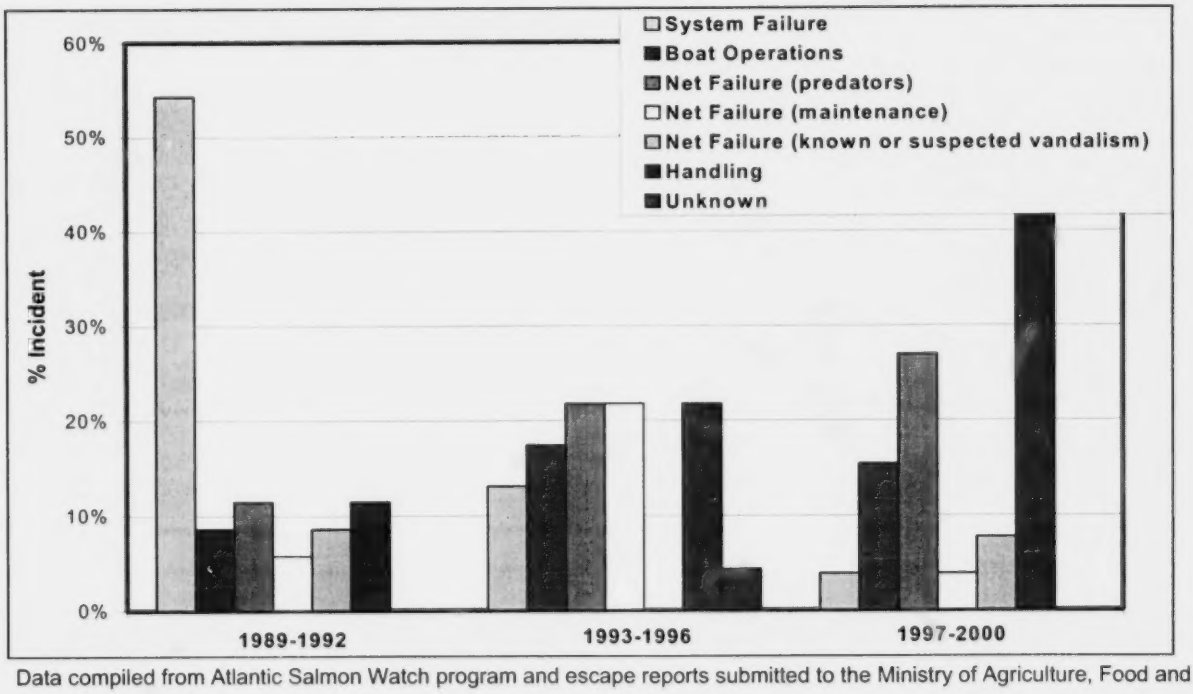
Data compiled from Atlantic Salmon Watch program and escape reports submitted to the Ministry of Agriculture, Food and Fisheries
% incident: percentage of escape incidents over a four year interval
# incident: total number of escape incidents over a four year interval
% pieces: percentage of the total number of fish lost over a four year interval

Figure 1: Causes of Marine Farmed Salmon Escapes by Percentage of Reported Fish Lost.



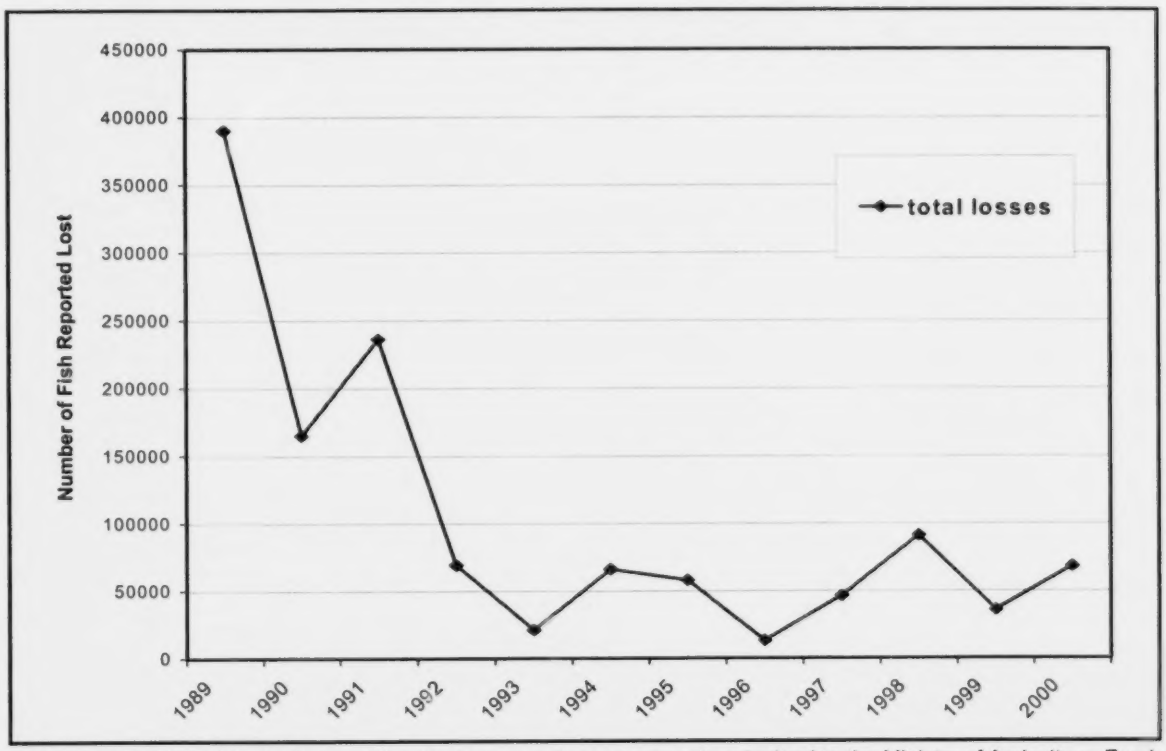
Data compiled from Atlantic Salmon Watch program and escape reports submitted to the Ministry of Agriculture, Food and Fisheries.

Figure 2. Causes of Marine Farmed Salmon Escapes by Percentage of Reported Incidents.



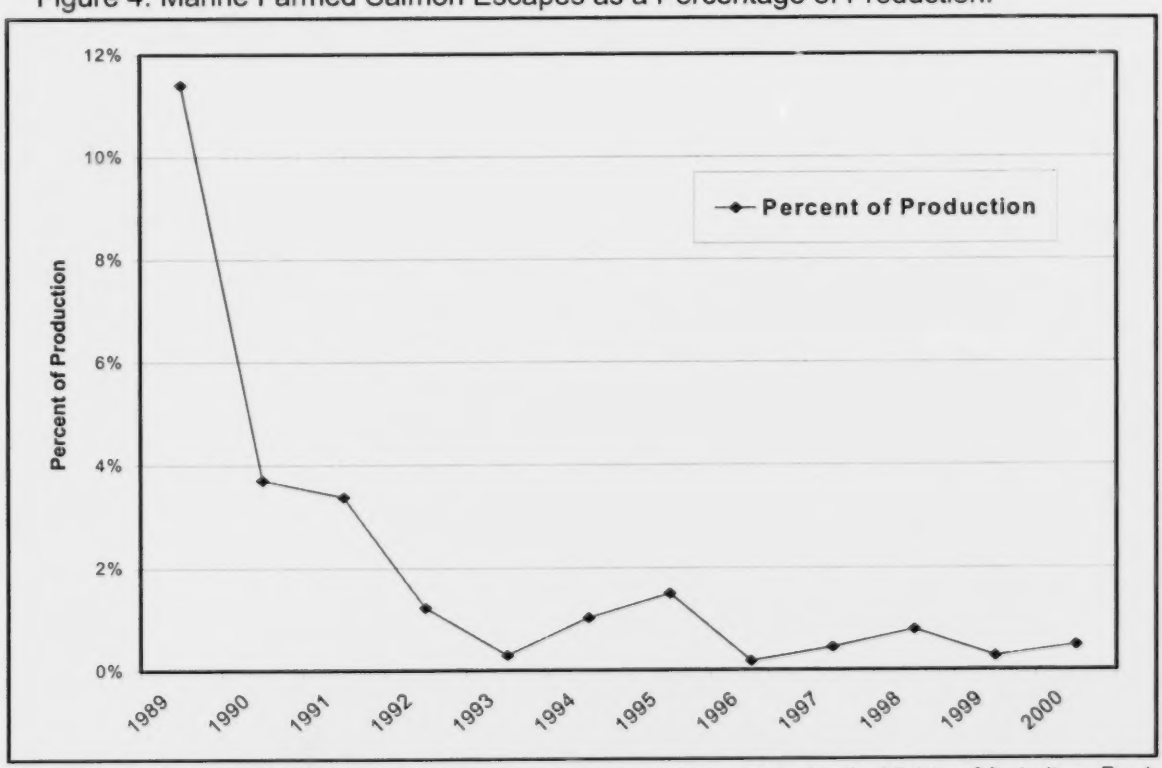
Data compiled from Atlantic Salmon Watch program and escape reports submitted to the Ministry of Agriculture, Food and Fisheries.

Figure 3. Marine Farmed Salmon Losses in British Columbia 1989-2000



Data compiled from Atlantic Salmon Watch program and escape reports submitted to the Ministry of Agriculture, Food and Fisheries.

Figure 4. Marine Farmed Salmon Escapes as a Percentage of Production.



Data compiled from Atlantic Salmon Watch program and escape reports submitted to the Ministry of Agriculture, Food and Fisheries.

Site Name	Cliff Cove	Steamer Point	Lutes Creek	Hecate
MAFF Reference Number	404	1079	1078 (1)	1078 (2)
Inspection Date	23-Aug-2002	21-Aug-2002	22-Aug-2002	22-Aug-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act				
Site Configuration	X	X	X	X
Biomass	X			X
ESCAPE RESPONSE				
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	X	X	X	X
FARM SITE OBSERVATIONS				
Is all cage support equipment designed, constructed and installed with the aim of preventing entanglement and chafing with containment nets, predator nets and shark guard nets? **sA5(a)**		X		
MWLAP INSPECTION COMPLETED	YES	YES	YES	YES
NON-COMPLIANCE NOTED	NONE	NONE	BC Fire Code: Minimum 110% containment required for fuel storage.	BC Fire Code: Minimum 110% containment required for fuel storage.

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Indian Bay	Eagle Bay	Baxter	Dawley Passage
MAFF Reference Number	233	244	776	1596
Inspection Date	4-Jul-2002	4-Jul-2002	4-Jul-2002	4-Jul-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act				
Special proviso or licence condition				x
Site Configuration		x	x	x
ESCAPE REPORTS s.8(1)				
Escapes Reported as Required		x		
INSPECTION RECORDS				
Are net cage records kept that include: **sA21**				
Records of the most recent out of water servicing and inspection? **sA21(as per A18 a-f)**	x	x	x	x
ESCAPE RESPONSE				
Are arrangements in place with authorities to cbtain recapture approvals? **s.A40 (see ntoe)**				
MWLAP INSPECTION CONDUCTED	n/a	n/a	n/a	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Power Bay	Vantage point	Salten	Kunechin	Salmon Inlet	Site 13	Jervis
MAFF Reference Number	219	221	332	408	412	746	754
Inspection Date	24-Jul-2002	23-Jul-2002	23-Jul-2002	23-Jul-2002	23-Jul-2002	23-Jul-2002	24-Jul-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act							
Site Configuration Non Compliance	x		x				
ESCAPE RESPONSE							
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**		x	x	x	x		
MWLAP INSPECTION CONDUCTED	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Doctor Bay
MAFF Reference Number	456
Inspection Date	24-Jul-2002
ESCAPE RESPONSE	
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	x
MWLAP INSPECTION CONDUCTED	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

YELLOW ISLAND AQUACULTURE (1994) LTD

Site Name	**Discovery Passage**
MAFF Reference	216
Inspection Date	24-Sep-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act	
Site Configuration	x
INVENTORY RECORDS s5(1)	
Weekly Morts, with causes and numbers?	x
Are these records on site? s.5(2)	x
INSPECTION RECORDS	
Are the net cage maintenance records kept on-site? s.A 21	x
ESCAPE RESPONSE	
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	
FARM SITE OBSERVATIONS	
Is the water line rope the primary attachment point? **s.A7**	x
Does the jump net extend 1 metre? s.A8	x
BOAT DOCKING	
Designated docking site? **s.A26**	x
Docking site marked? **s.A27**	x
Docking site designed to prevent damage? **s.A28**	x
MWLAP INSPECTION CONDUCTED	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	St. Vincent Bay
MAFF Reference	247
Inspection Date	22-Jul-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act	
Site Configuration	X
ESCAPE RESPONSE	
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (SEE NOTE)**	X
MWLAP INSPECTION CONDUCTED	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Jane Bay
MAFF Reference Number	270
Inspection Date	27-Jun-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act	
Site Configuration	x
INSPECTION RECORDS	
Are Net cage records kept that include: **sA21**	
Records of the most recent out of water servicing and inspection? **sA21(as per A18 a-f)**	x
ESCAPE RESPONSE	
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	x
NET CAGE INSPECTIONS	
Are underwater inspections completed before a new group of fish are introduced? **s.A19(2)(a)**	x
BOAT DOCKING	
Docking site marked? **s.A27**	x
MWLAP INSPECTION CONDUCTED	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Sonora Island
MAFF Reference Number	211
Inspection Date	26-Jun-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act	
Site Configuration	x
ESCAPE RESPONSE	
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	x
THERAPEUTANTS & RECORDS KEEPING s.9(3)	
Are drug administration records kept that include **s.8(3)**	
A log with drug, how administered, specifying schedule, date commenced, date last treatment and name of administrator?	x
MWLAP INSPECTION CONDUCTED	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Port Elizabeth	Larsen Isl	Koskimo	Nodales Channel	Brougham Point	Arrow Pass
MAFF Reference	141	143	144	378	388	466
Inspection Date	18-Sep-2002	18-Sep-2002	13-Aug-2002	21-May-2002	21-May-2002	17-Sep-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act						
Site Configuration	X			X	X	
Biomass						
INSPECTION RECORDS						
Records of the most recent out of water servicing and inspection? **sA21, (as per A18 a-f)**						
ESCAPE RESPONSE						
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	X	X	X		X	X
FARM SITE OBSERVATIONS						
Is the water line rope the primary attachment point? **s.A7**	X					
BOAT DOCKING						
Docking site marked? **s.A27**	X	X	X	X		X
MWLAP INSPECTION CONDUCTED	YES	YES	YES	n/a	n/a	YES
Non-compliance identified	none	none	1) Water Act: Water license required.			none

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Midsummer Island	Wicklow Point	Sargeaunt Pass	Potts Bay	Monday Rock	Mahatta West	Doctor Islets
MAFF Reference	467	820	1059	1145	1237	1238	1586
Inspection Date	17-Sep-2002	17-Sep-2002	27-Sep-2002	17-Sep-2002	13-Aug-2002	13-Aug-2002	27-Sep-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act							
Site Configuration	X	X	X	X	X		X
Biomass							X
INSPECTION RECORDS							
Records of the most recent out of water servicing and inspection? **sA21, (as per A18 a-f)**				X			
ESCAPE RESPONSE							
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	X	X	X	X	X	X	X
FARM SITE OBSERVATIONS							
Is the water line rope the primary attachment point? **s.A7**							
BOAT DOCKING							
Docking site marked? **s.A27**	X	X	X	X	X		
MWLAP INSPECTION CONDUCTED	YES	YES	YES	YES	YES	YES	YES
Non-compliance identified	none	1) Water Act: Water license required.	none	none	none	1) Water Act: Water license required.	none

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Saltspring Island	Orchard Bay	Center Cover	Hoskyn Channel	Dunsterville Bay	Sonora Point	Read Island
MAFF Reference Number	56	108	112	137	138	380	547
Inspection Date	18-Jul-2002	4-Jun-2002	6-Aug-2002	19-Jun-2002	19-Jun-2002	30-Jul-2002	10-Jun-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act							
Site Configuration		X	X		X		
Biomass				X			
ESCAPE REPORTS s.8(1)							
Escapes reported as required.							
INVENTORY RECORDS s5(1)							
Are these records on site? s.5(2)					X		
INSPECTION RECORDS							
Are Net cage records kept that include: **sA21**							
Records of the most recent out of water servicing and inspection? **sA21(as per A18 a-f)**		X			X		
Accumulated time in the water since the most recent out of water service?					X		
Description, dates of and reasons for all repairs made?					X		
Are the above net cage maintenance records kept on-site? **s.A21**					X	X	
ESCAPE RESPONSE							
Are arrangements in place with authorities to obtain recapture approvals? **s.A40**	X						
THERAPEUTANTS & RECORDS KEEPING s.9(3) (see note)							
Are drug administration records kept that include: **s.8(3)**							
Aquaculture licence number and holder?							
A log with drug, how administered, specifying schedule, date commenced, date last treatment and name of administrator?						X	
FARM SITE OBSERVATIONS							
Is the water line rope the primary attachment point? **s.A7**						X	X
If nets are stored on site does it minimize deterioration? **s.A12**							
NET CAGE INSPECTIONS							
Are all nets permanently marked with inventory number? **s.A20**							X
BOAT DOCKING							
Docking site marked? **s.A27**							
MWLAP INSPECTION CONDUCTED	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Non-compliance identified							

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Cyrus Rocks	Young Pass	HoHoae Island	Amai	Arthur Island	Lockalsh	Jackson Pass	Charlie's Place
MAFF Reference Number	733	769	1158	1159	1598	884	1580	1554
Inspection Date	2-Apr-2004	8-Jun-2002	6-Aug-2002	6-Aug-2008	30-Oct-2002	7-Jun-2002	7-Jun-2002	8-Aug-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act								
Site Configuration	X	X	X	X	X	X	X	X
Biomass						X		
ESCAPE REPORTS s.8(1)								
Escapes reported as required.	no						no	
INVENTORY RECORDS s5(1)								
Are these records on site? s.5(2)								
INSPECTION RECORDS								
Are Net cage records kept that include: **sA21**								
Records of the most recent out of water servicing and inspection? **sA21(as per A18 a-f)**								
Accumulated time in the water since the most recent out of water service?								
Description, dates of and reasons for all repairs made?								
Are the above net cage maintenance records kept on-site? **s.A21**								
ESCAPE RESPONSE								
Are arrangements in place with authorities to obtain recapture approvals? s.A40		X				X	X	
THERAPEUTANTS & RECORDS KEEPING s.9(3) (see note)								
Are drug administration records kept that include: **s.8(3)**								
Aquaculture licence number and holder?					X			
A log with drug, how administered, specifying schedule, date commenced, date last treatment and name of administrator?								
FARM SITE OBSERVATIONS								
Is the water line rope the primary attachment point? **s.A7**	X	X						
If nets are stored on site does it minimize deterioration? **s.A12**						X	X	
NET CAGE INSPECTIONS								
Are all nets permanently marked with inventory number? **s.A20**		X						
BOAT DOCKING								
Docking site marked? **s.A27**						X	X	
MWLAP INSPECTION CONDUCTED	n/a	n/a	n/a	n/a	YES	n/a	n/a	
Non-compliance identified					1) Waste Management: Disposal of waste from net cleaning.			

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Phillips Arm	Lee's Bay	Glacial Creek	Homfry	Far side	Egerton Creek	Fredrick Arm	Hardy Bay	Shelter Bay
MAFF Reference	78	100	303	402	553	553	553	706	831
Inspection Date	17-Jun-2002	18-Jun-2002	22-Jul-2002	24-Jul-2002	17-Jun-2002	17-Jun-2002	17-Jun-2002	8-Aug-2002	7-Aug-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act									
Aquaculture Licence Current									
Special Proviso or Licence Condition									
Site Configuration	x	x			x	x	x	x	x
Biomass	x	x						x	
ESCAPE RESPONSE									
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	x	x	x	x	x	x	x	x	x
FARM SITE OBSERVATIONS									
Is the water line rope the primary attachment point? **s.A7**						x			
Are net cages weighted at sufficient points to ensure distribution of the weight? **s.A10**									
NET CAGE INSPECTIONS									
Are underwater inspections completed before a new group of fish are introduced? **s.A19(2)(a)**								x	
FISH HANDLING									
If fish handling is occurring is the company using spotters when a large vessel is operating nearby? **s.A31**								x	
MWLAP INSPECTION CONDUCTED	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Non-compliance identified									

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites

Site Name	Bell	Shaw Point	Raynor	Doyle	Duncan	Althorpe Point	Shelter Bay	Marsh Bay	Cleagh
MAFF Reference	892	1136	1198	1288	1293	1300	1350	1351	1376
Inspection Date	7-Aug-2002	18-Jun-2002	7-Aug-2002	8-Aug-2002	8-Aug-2002	18-Jun-2002	7-Aug-2002	7-Aug-2002	13-Aug-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act									
Aquaculture Licence Current							x		
Special Proviso or Licence Condition							x		
Site Configuration	x	x	x	x	x	x	x		x
Biomass			x	x	x	x			
ESCAPE RESPONSE									
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	x	x	x	x	x	x	x	x	x
FARM SITE OBSERVATIONS									
Is the water line rope the primary attachment point? **s.A7**									
Are net cages weighted at sufficient points to ensure distribution of the weight? **s.A10**			x		x		x		x
NET CAGE INSPECTIONS									
Are underwater inspections completed before a new group of fish are introduced? **s.A19(2)(a)**									
FISH HANDLING									
If fish handling is occurring is the company using spotters when a large vessel is operating nearby? **s.A31**									
MWLAP INSPECTION CONDUCTED	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes
Non-compliance identified									1) Water Act: Water license required

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites

Site Name	MacIntyre	Bawden	Dixon	Ross Passage	Bedwell	Saranac	Fortune	Miller
Maff Reference Number	1291	227	234	314	520	527	540	1507
Inspection Date	13-Aug-2002	29-Jan-2002	29-Jan-2002	14-Aug-2002	13-Aug-2002	13-Aug-2002	29-Jan-2002	29-Jan-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section 16 (D) Fisheries Act								
Site Configuration	x	x	x		x	x	x	x
Biomass	x		x		x			x
ESCAPE REPORTS s.8(1)								
Escapes reported as required?			x				x	x
INVENTORY RECORDS s5(1)								
Transport, transfer and introduction of fish.	x							
Weekly morts, with causes and numbers.								x
Each escape of fish from the facility.	x							
Are these records on site? **s.5(2)**						x		
INSPECTION RECORDS								
Written records maintained of net cage inspections by divers? **s.6(1)**			x				x	
Are net cage records kept that include: (sA21)								
Inventory control number?				x				x
Dimensions?				x				
Mesh size?				x				
Records of the most recent out of water servicing and inspection? **sA21(as per A18 a-f)**				x	x			
Accumulated time in the water since the most recent out of water service?				x		x		
Description and dates of each underwater inspection?				x				
Description dates of and reasons for all repairs made?				x				
Are the above net cage maintenance records kept on-site? **s.A21**		x	x	x	x		x	x
ESCAPE RESPONSE								
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (see note)**	x	x		x	x	x		
THERAPEUTANTS & RECORDS KEEPING s.9(3)								
Are drug administration records kept that include: **(s.8(3))**								
A log with the drug, how administered, specifying schedule, date commenced, date last treatment and name of administrator?	x			x	x	x		
FARM SITE OBSERVATIONS								
Are all cage support equipment designed, constructed and installed with the aim of preventing entanglement and chafing with containment nets, predator nets and shark guard nets? **sA5(a)**							x	
Is the water line rope the primary attachment point? **s.A7**							x	x
Does the jump net extend 1 metre? **s.A8**								x
NET CAGE INSPECTIONS								
Are all nets permanently marked with an inventory number? **s.A20**							x	x
BOAT DOCKING								
Docking site marked? **s.A27**	x					x		
MWLAP INSPECTION CONDUCTED	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Venture Point	Cypress Harbour	Sir Edmund Bay	Cecil Island	Maude Island
MAFF Reference Number	306	458	728	819	869
Inspection Date	16-May-2002	12-Sep-2002	12-Sep-2002	8-Aug-2002	14-Aug-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN COMPLIANCE - Section16 (D) Fisheries Act					
Site Configuration		X	X	X	X
Biomass			X	X	X
INSPECTION RECORDS					
Daily Visual Recorded in the Log? **s.A5(e)**		X			
Written records maintained of net cage inspections by divers? **s.6(1)**		X			
Are net cage records kept that include: **sA21**					
Inventory control number?					
Dimensions?					
Mesh size?					
Records of the most recent out of water servicing and inspection? **sA21(as per A18 a-f)**		X	X	X	X
Description and dates of each underwater inspection?		X			
Are the above net cage maintenance records kept on-site? **s.A21**		X			X
ESCAPE RESPONSE					
Is the escape plan posted in a visible location? **s.A36**					X
Can staff describe the contents of the plan? **s.A36**					X
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (SEE NOTE)**	X	X	X	X	X
FARM SITE OBSERVATIONS					
Are all cage support equipment having potential to contact the net cage maintained to prevent catching or abrading nets **s.A5(b)**					
Is the water line rope the primary attachment point? **s.A7**		X			
NET CAGE INSPECTIONS					
Are underwater inspections completed before a new group of fish are introduced? **s.A19(2)(a)**					
Are complete inspections done on active net cages at least every 60 days? **s.A19(2)(b)**					
Are all nets permanently marked with an inventory number? **s.A20**					
BOAT DOCKING					
Designated docking site? **s.A26s**					
Docking site marked? **s.A27**		X		X	
MWLAP INSPECTION CODUCTED	n/a	YES	YES	YES	YES
NON-COMPLIANCE ISSUE NOTED		1) Waste Management: - Sewage treatment. 2) Waste Management: - Sewage discharge. 3) Waste Management: Disinfectant disposal. 4) BC Fire Code: - Fuel storage and generator set, minimum 110% containment.	NONE	NONE	NONE

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a consideration for those sites were only Chinook or Coho or other pacific species were being cultured.

Site Name	Burdwood	Wehlis Bay	Mt Simmonds	Barkley Sound	San Mateo Bay	Raza Island
MAFF Reference Number	1144	1335	1336	169	224	304
Inspection Date	12-Sep-2002	14-Aug-2002	14-Aug-2002	27-Jun-2002	27-Jun-2002	22-May-2002
TERMS AND CONDITIONS - MANAGEMENT PLAN						
COMPLIANCE - Section16 (D) Fisheries Act						
Site Configuration	X	X	X	X	X	X
Biomass		X	X			
INSPECTION RECORDS					X	
Daily Visual Recorded in the Log? **s.A5(e)**						
Written records maintained of net cage inspections by divers? **s.6(1)**						
Are net cage records kept that include: **sA21**						
Inventory control number?				X		
Dimensions?				X		
Mesh size?				X		
Records of the most recent out of water servicing and inspection? **sA21(as per A18 a-f)**				X		
Description and dates of each underwater inspection?						
Are the above net cage maintenance records kept on-site? **s.A21**				X		
ESCAPE RESPONSE						
Is the escape plan posted in a visible location? **s.A36**			X			
Can staff describe the contents of the plan? **s.A36**						
Are arrangements in place with authorities to obtain recapture approvals? **s.A40 (SEE NOTE)**	X	X	X	X	X	X
FARM SITE OBSERVATIONS						
Are all cage support equipment having potential to contact the net cage maintained to prevent catching or abrading nets **s.A5(b)**			X			
Is the water line rope the primary attachment point? **s.A7**				X		
NET CAGE INSPECTIONS						
Are underwater inspections completed before a new group of fish are introduced? **s.A19(2)(a)**					X	
Are complete inspections done on active net cages at least every 60 days? **s.A19(2)(b)**					X	
Are all nets permanently marked with an inventory number? **s.A20**				X		
BOAT DOCKING						
Designated docking site? **s.A26s**				X		
Docking site marked? **s.A27**	X	X		X		
MWLAP INSPECTION CODUCTED	YES	YES	YES	n/a	n/a	n/a
NON-COMPLIANCE ISSUE NOTED	NONE	NONE	1) Water Act: - Water license required. 2) Waste Management: - Sewage treatment. 3) Waste Management: - Sewage disposal.			

NOTE: Compliance to Section 40 - requirement for arrangements in place with DFO for a recapture permit was accessed on the basis of the company having a ZZA permit. For this reason, in terms of statistics reporting within the annual, inspection report, this deficiency was counted only once per company. As the permit is only issued for the recapture of Atlantic salmon it was not a considerat on for those sites were only Chinook or Coho or other pacific species were being cultured.

MARINE FINFISH COMPLIANCE MATRIX – May 12, 2003

COMPLIANCE ISSUE	LEGISLATION CONTRAVENED	LICENSEE ACTION REQUIRED	TIMELINE FOR COMPLETION OF REQUIRED ACTION	LICENSEE FOLLOW-UP	ENFORCEMENT ACTION/AGENCY
Disposal of blood water directly to environment	Section 3(2) Waste Management Act/ Section 36(3) Fisheries Act (federal)	Subject to the Regional Waste Manager's direction	As directed	As directed	MAFF to forward non-compliance occurrences to Regional Waste Manager on a case by case basis. Action to be determined based upon a review of the specific fact pattern and compliance history.
Disposal of net cleaning waste directly to environment resulting from major net cleaning (does not include in situ day to day maintenance)	Section 3(2) Waste Management Act/Section 36(3)Fisheries Act (federal)	Subject to the Regional Waste Manager's direction	As directed	As directed	MAFF to forward non-compliance occurrences to Regional Waste Manager on a case by case basis. Action to be determined based upon a review of the specific fact pattern and compliance history.
Disposal of morts w/o permit/approval	Section 3(2) Waste Management Act	Cease burning/burying etc. of morts. Dispose at approved facility	Immediately	Provide documentation to inspector to verify use of approved facility	Consult with WLAP for direction. Minor amount of morts may result in issuance of ticket whereas major amounts likely to result in formal investigation
Non marine mammal predator (wildlife) trapping/killing w/o permit or using licensed trapper	Section 11 and 26 Wildlife Act	Cease trapping/killing. Obtain a permit or the services of licensed trapper for predator control/or closed season authorization	Immediately	Provide documentation to inspector to confirm issuance of a permit or the use of licensed trapper	Violation ticket for first offence issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Disposal of refuse – burning or burying of wastes	Section 3(2) Waste Management Act	Cease burning/burying of wastes	Immediately	Provide written confirmation as to disposal methods to inspector within 14 days	Violation ticket for first offence issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Predator prevention carcass disposal to land w/o permit/approval	Section 3(2) Waste Management Act	Dispose carcass at approved facility or Apply for Waste Management Permit and Land Tenure for disposal site	Within 30 days	Provide documentation to inspector confirming use of approved facility or copy of applications	Violation ticket for first offence issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Disposal of disinfectants directly to environment	Section 3(2) Waste Management Act/ Section 36(3) Fisheries Act (federal)	Follow disposal requirements of MSDS and/or dispose at an approved disposal facility	Immediately	Confirm disposal practices/facility to inspector within 14 days	Consult with WLAP for direction.
Fail to provide 110% containment for fuel storage	BC Fire Code (1998)	Install 110% containment for fuel	N/A	Provide written confirmation of resolution to inspector within 60 days.	File to be referred to the Office of the Fire Commissioner for resolution
Fail to conduct environmental monitoring of a new facility prior to applying for registration	Section 3(1) - Finfish Aquaculture Waste Control regulation	Conduct environmental monitoring	Subject to Regional Waste Manager's direction	Provide documentation to inspector confirming environmental monitoring has been completed and submitted to Regional Waste Manager	Formal investigation by WLAP
Stock a facility with fish without registering the facility in accordance with the Aquaculture Waste Control regulation	Section 3(2) - Finfish Aquaculture Waste Control regulation	Submit registration to the Regional Waste Manager	Within 14 days	Provide documentation to inspector confirming registration submitted to Regional Waste Manager	Formal investigation by WLAP
Effective September 21, 2003 – mean free sulphide concentration on soft bottom at or beyond 30 meters from 0 meter station is statistically significantly greater than 6000 micromolar	Section 4(1) - - Finfish Aquaculture Waste Control regulation	Submit a remedial action plan to the Regional Waste Manager, and immediately thereafter implement the plan	Within 30 days of environmental monitoring	Implement remedial action plan	Formal investigation by WLAP
Effective September 21, 2003 – mean taxon richness or mean total abundance at a sampling facility on a soft bottom at or beyond the tenure perimeter is statistically significantly different than the mean reference or baseline	Section 4(2) - - Finfish Aquaculture Waste Control regulation	Submit a remedial action plan to the Regional Waste Manager, and immediately thereafter implement the plan	Within 30 days of environmental monitoring	Implement remedial action plan	Formal investigation by WLAP
Effective September 21, 2003 – Fail to conduct biological monitoring and and comply with pre-stocking requirements when mean free sulphide concentration on a soft bottom at or beyond the tenure perimeter is statistically significantly greater than the mean reference or baseline sulphide concentration	Section 5 – Finfish Aquaculture Waste Control regulation	Conduct biological monitoring	As determined by Regional Waste Manager	Submit biological monitoring results as directed by Regional Waste Manager	Formal investigation by WLAP

The enforcement responses identified in the matrix are considered the preferred approach, however, the specific circumstances of each non-compliance are to be assessed in determining the appropriate enforcement response. Consultation between agencies is required on some issues of non-compliance prior to determining an enforcement response.

MARINE FINFISH COMPLIANCE MATRIX – May 12, 2003

COMPLIANCE ISSUE	LEGISLATION CONTRAVENED	LICENSEE ACTION REQUIRED	TIMELINE FOR COMPLETION OF REQUIRED ACTION	LICENSEE FOLLOW-UP	ENFORCEMENT ACTION/AGENCY
Effective March 21, 2004 – Restocks facility when mean free sulphide concentration exceeds the standards prescribed in Section 6 of the Finfish Aquaculture Waste Control regulation	Section 6(2) – Finfish Aquaculture Waste Control regulation	Action to be determined by the Regional Waste Manager	As determined by the Regional Waste Manger	As determined by the Regional Waste Manger	Formal investigation by WLAP.
Exceed maximum daily discharge rate of domestic sewage 2.5 cubic meters/day	Section 7(b)(i) - Finfish Aquaculture Waste Control regulation	Install system to meet the regulation requirements	Within 30 days	Provide documentation to inspector confirming installation of new system	Formal investigation by WLAP.
Fail to treat sewage with a septic tank designed with a retention time of less than two days prior to discharge, or device with a concentration of total suspended solids exceeding 130 mg/l	Section 7(b)(ii) - Finfish Aquaculture Waste Control regulation	Install system to meet the regulation requirements	Within 30 days	Provide documentation to inspector confirming installation of new system	Formal investigation by WLAP.
Disposal of sewage at a discharge point less than 15 meters below surface of the water	Section 7(b)(iii) - Finfish Aquaculture Waste Control regulation	Install a 15 meter outfall pipe as per regulation requirements.	Within 30 days	Provide documentation to inspector confirming outfall pipe extension.	Formal investigation by WLAP.
Fail to maintain records related to construction/operation and maintenance of sewage treatment works for inspection by manager or officer	Section 7(iv) - Finfish Aquaculture Waste Control Regulation	Ensure records are maintained	Immediately	Provide documentation to inspector confirming records are maintained	Violation ticket for first offence issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Fail to keep a copy of the BMP plan at facility	Section 8(3)(a) - Finfish Aquaculture Waste Control Reg.	Ensure BMP Plan is onsite at facility	Within 60 days	Provide written confirmation to inspector within 30 days of the date the BMP's were finalized that BMP's are onsite at facility	Violation ticket for first offence issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Fail to make the BMP plan available upon request of the manager or an officer	Section 8(3)(a) - Finfish Aquaculture Waste Control Reg.	Produce a copy of the BMP Plan	Immediately	N/a	Violation ticket for first offence issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Fail to amend the BMP plan whenever there is a change in the facility which materially increases the release/potential release of harmful materials	Section 8(3)(b) - Finfish Aquaculture Waste Control Reg.	Amend the BMP plan	Within 30 days	Provide written confirmation to inspector within 7 days of the BMP being amended	Violation ticket for first offence issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Fail to conduct environmental monitoring	Section 9 - Finfish Aquaculture Waste Control Reg.	Undertake environmental monitoring	Within 30 days of prescribed sampling timeframe, or as directed by Regional Waste Manager	As determined by Regional Waste Manager	Formal investigation by WLAP.
Fail to submit environmental monitoring results	Section 10 - Finfish Aquaculture Waste Control Reg.	Submit environmental monitoring results to Regional Waste Manager	Within 14 days	Confirmation to inspector that results forwarded to Regional Waste Manager	Formal investigation by WLAP.
Fail to report information required in Section 10(5) of the Aquaculture Waste Control regulation	Section 10(5) - Finfish Aquaculture Waste Control Reg.	Submit environmental monitoring results to Regional Waste Manager	Within 14 days	Confirmation to inspector that results forwarded to Regional Waste Manager	Formal investigation by WLAP.
Fail to notify Regional Waste manager w/i 24 hrs of implementing fish kill contingency plan	Section 10(6) - Finfish Aquaculture Waste Control Reg.	Notify Regional Waste Manager	Immediately	N/A	Formal investigation by WLAP.

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MARINE FINFISH COMPLIANCE MATRIX – May 12, 2003

COMPLIANCE ISSUE	LEGISLATION CONTRAVENED	LICENSEE ACTION REQUIRED	TIMELINE FOR COMPLETION OF REQUIRED ACTION	LICENSEE FOLLOW-UP	ENFORCEMENT ACTION/AGENCY
Exceed Management plan biomass levels	Fisheries Act – Condition of Licence	Submit a revised management plan or adjust Production level	Within 30 days	Verification to MAFF in writing of reduced production or submission of a management plan	Need for consultation between MAFF and WLAP to evaluate environmental impacts. If non-compliance has resulted in environmental waste standard being exceeded, requires referral to WLAP for investigation. Review of compliance history by MAFF Inspection staff, and where appropriate, in liaison with biological staff, for farm to determine status of MP history for site, and/or previous warnings to company. If compliance history is poor, formal referral to WLAP for investigation. For new instances of excess biomass production, violation ticket to be issued where the company has not responded to MAFF's initial inspection request. (the ticket will be for failure to comply with licence conditions) Formal investigation by WLAP for subsequent occurrences.
Unapproved species on site	Fisheries Act – Condition of Licence	Submit a revised management plan or remove unauthorized species	Within 30 days	Verification to MAFF in writing by way of management plan submission or company verifies they have removed unauthorized species	Depending upon review of compliance history of company, MAFF refers the matter for investigation to WLAP immediately, or subsequent to the company failing to submit a revised management plan.
Operating a facility without a licence	Fisheries Act	Fisheries Act			Referral directly to WLAP – noting differences between unlicensed operations and delays in licence renewals.
Failure to submit required reports or records	Fisheries Act	Submit requested reports	Within requested timeframe	Reports to be submitted within 60 days of the identified deadline	Violation tickets or warnings if reports not received and responded to MAFF request. Formal investigation by WLAP for subsequent occurrences.
Failure to report suspected escapes verbally or in writing	Fisheries Act – Aquaculture Regulation	Report 24 hours verbal In writing 7 days Implement immediate corrective action	Immediate/seven days	N/A	Violation ticket or warning issued by MAFF where the report is suspected and no fish are lost. Formal investigation by WLAP for subsequent occurrences or if the inspector believes there has been a significant escape.
Failure to report an escape verbally or in writing	Fisheries Act – Aquaculture Regulation	Report 24 hours verbal In Writing 7 days Implement immediate corrective action	Immediate/seven days	N/A	Warning or violation ticket issued by MAFF. Where the inspector believes there may be a significant loss of fish, or for repeat occurrences refer to WLAP for formal investigation and RCC.
Unauthorized release of fish	Fisheries Act – Aquaculture Regulation	Report 24 hours verbal In Writing 7 days Implement immediate corrective action	Immediate/seven days	N/A	Referral to WLAP for investigation and RCC.
Unauthorized escape of fish	Fisheries Act – Aquaculture Regulation	Report 24 hours verbal In Writing 7 days Implement immediate corrective action	Immediate/seven days	N/A	Where there may be a significant loss of fish the file to be turned over directly to WLAP for formal investigation and RCC.
Fail to comply with therapeutant use and drug record keeping	Fisheries Act - Aquaculture Regulation	Adjust record keeping to regulations	Immediate	Verification to MAFF in writing to confirm adjustment has been made.	Warning or violation ticket for noncompliance issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Fail to comply with requirements for inventory, training and maintenance. Records and Reports	Fisheries Act – Aquaculture Regulation	Adjust record keeping to regulations	Within 30 days	Verification to MAFF in writing to confirm adjustment has been made	Warning and or violation ticket issued by MAFF if corrective measures have not been implemented. Referral to WALP for continued/subsequent occurrences.
Processing fish on site w/o license	Fisheries Act – Aquaculture Regulation	Cease activity	Immediate	Verification to MAFF in writing may be requested	Warning or violation ticket issued by MAFF. Formal investigation by WLAP for subsequent occurrences.
Obstruction	Fisheries Act – Aquaculture Regulation	N/A	N/A	N/A	Referral to WLAP for formal investigation.
Containment Structures, Cage Support, Design Installation and Maintenance	Fisheries Act – Aquaculture Regulation Appendix 2	Consult with MAFF on design and construction approval requirements	Within 30 days	Verification to MAFF in writing the company has reviewed and implemented corrective measures	Warning or violation ticket issued by MAFF. Formal investigation by WLAP for continued/subsequent occurrences.

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MARINE FINFISH COMPLIANCE MATRIX – May 12, 2003

COMPLIANCE ISSUE	LEGISLATION CONTRAVENED	LICENSEE ACTION REQUIRED	TIMELINE FOR COMPLETION OF REQUIRED ACTION	LICENSEE FOLLOW-UP	ENFORCEMENT ACTION/AGENCY
Fail to meet Net Cage Mesh Strength	Fisheries Act – Aquaculture Regulation Appendix 2	Net strength failure – company to immediately remove net.	Immediate	Verification to MAFF in writing that net has been removed	If non compliant to the request to remove net, referral to WLAP for investigation
Fail to maintain Net Servicing Records and Net Tagging	Fisheries Act – Aquaculture Regulation Appendix 2	Implement measures to correct deficiencies in record keeping	Within 30 days	Verification to MAFF in writing corrective measure have been implemented	Warning or Violation tickets issued by MAFF. Formal investigation by WLAP for continued/subsequent occurrences.
Improper Boat Operations	Fisheries Act – Aquaculture Regulation Appendix 2	Implement corrective measures to ensure proper boat usage	Within 30 days	Verification to MAFF in writing that corrective measures have been implemented	Warning or violation ticket issued by MAFF. Formal investigation by WLAP for continued/subsequent occurrences.
Fail to comply with operational activities	Fisheries Act – Aquaculture Regulation Appendix 2	Implement corrective measures	Within 30 days	Verification to MAFF in writing that corrective measures have been implemented	Warning or violation ticket issued by MAFF. Formal investigation by WLAP for continued/subsequent occurrences.
Fail to implement/follow Best Management Practices	Fisheries Act – Aquaculture Regulation Appendix 2	Implement identified corrective measures	Within 30 days	Verification to MAFF in writing that corrective measures have been implemented	Warning or Violation ticket issued by MAFF. Formal investigation by WLAP for continued/subsequent occurrences.
Fail to comply with training requirements for escape response	Fisheries Act – Aquaculture Regulation Appendix 2 - As to the development, posting and staff training associated with escape response	Implement identified corrective measures	Within 30 days	Verification to MAFF in writing that corrective measures have been implemented.	Warning or Violation ticket issued by MAFF. Formal investigation by WLAP for continued/subsequent occurrences.
Fail to implement corrective action to prevent further escapes	Fisheries Act – Aquaculture Regulation Appendix 2 - As to failure to ensure corrective action implemented to prevent further escapes; As to take measures to attempt to recapture	N/A	Immediate	N/A	Formal investigation by WLAP
Use of lake or stream water without a water license	Section 41(1)(m) Water Act	Apply for Water license or cease use of water	Within 30 days	Provide confirmation to inspector that use of water has ceased, or a license application has been submitted.	Upon referral, LWBC will review MAFF inspection report and notify the client of required action. MAFF and WLAP will be copied. If warranted, LWBC will commence enforcement action in coordination with WLAP.
Operating a facility without a tenure	Land Act	Land Act			Referral directly to LWBC – noting differences between untenured operations and delays in tenure renewals. LWBC will review MAFF inspection report and notify the client in writing of necessary action. MAFF and WLAP will be cc'd. If warranted, LWBC will commence trespass action in coordination with WLAP.
Improvements located outside Land tenure boundaries	Land Act	Comply with existing tenure or arrange a meeting to discuss with LWBC (MAFF inspector to notify LWBC)	Within 30 days	Provide confirmation improvements are within tenure or supply an amendment application package and new management plan	LWBC will review MAFF inspection report and notify the client in writing of necessary action. MAFF and WLAP will be cc'd. If warranted, LWBC will commence trespass action in coordination with WLAP.
Improvements do not comply with Management plan	Land Act	Comply with existing management plan or arrange a meeting to discuss with LWBC and MAFF (MAFF inspector to notify LWBC and MAFF licensing section)	Within 30 days	Provide confirmation improvements comply with management plan or submit new management plan	LWBC will review MAFF inspection report in consultation with MAFF Licencing Section and notify the client in writing of necessary action. MAFF and WLAP will be cc'd.

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Important Information (disclaimer and copyright information)

B.C. Reg. 256/2002
O.C. 836/2002

Deposited September 12, 2002

Waste Management Act

FINFISH AQUACULTURE WASTE CONTROL REGULATION

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Definitions

1 In this regulation:

"abundance" means the number of individual organisms or percent cover of a particular taxon in the benthic community at the Linnaean classification system level of

(a) family, for soft bottoms, and

(b) class, for hard bottoms;

"application" means application under section 3;

"bag cage" means an enclosure in a marine environment made of material impermeable to water and used to contain finfish;

"baseline" means before a facility begins operating;

"Beggiatoa" is a genus of bacteria that forms white mats on the sediment surface in areas of

intense organic enrichment;

"benthic" means on or in the seabed;

"benthic community" means the assemblage of organisms inhabiting the seabed;

"biota" means the benthic flora and fauna;

"BMP" means a Best Management Practices Plan described in section 8;

"Capitella" is a genus of polychaete that thrives in areas of intense organic enrichment;

"containment structures" means net cages, bag cages, tanks, and similar structures used to contain finfish for the purposes of aquaculture;

"containment structure array" means a group of containment structures physically attached to each other;

"DGPS" means a differential global positioning system;

"domestic sewage" means human excrement, water-borne human excretion or the water-carried wastes from liquid or non-liquid culinary uses, washing, cleansing, laundering, food processing or ice production;

"dry weight" means the gravimetric determination of the total residue left in a vessel after drying feed of the type used at the facility at a temperature of 103 to 105 degrees Celsius until the weight of the residue is constant;

"epifauna" means animals that live on top of the substratum;

"facility" means a finfish aquaculture farm located in marine water at a site licensed under section 14 of the *Fisheries Act;*

"facility sampling station" does not include a reference station;

"finfish" means fish of the classes Agnatha, Chondrichthyes or Osteichthyes grown by an operator;

"fish kill" means an amount of finfish equivalent to 4 000 kilograms or more that died within a 5 consecutive day period at a facility;

"footprint" means the area of the seabed on which there is a measurable accumulation of particulate wastes, or waste by-products, originating from a containment structure or a containment structure array and deposited by normal ocean currents;

"free sulphide" means sulphide ions not chemically bound to any other chemical constituent as measured following sections 3 to 5 of Protocols for Marine Environmental Monitoring (WLAP 2002);

"hard bottom" means a seabed composed of rock, shell or other hard materials that cannot be sampled by sediment grab sampling devices;

"infauna" means animals that live within the substratum;

"L&WBCI" means the Land & Water British Columbia Inc.;

"macrofauna" means animals with body sizes on the scale of millimetres;

"MAFF" means the Ministry of Agriculture, Food and Fisheries of British Columbia;

"management plan" means a Marine Commercial Finfish Aquaculture Management Plan required when applying for a licence for aquaculture under the *Fisheries Act,* for a tenure, or for a renewal of either;

"manager" has the same meaning as in section 1 of the *Waste Management Act;*

"megafauna" means animals with body sizes on the scale of centimetres;

"mortalities" means facility raised finfish that

(a) have died, and

(b) are not harvested for human consumption;

"net cage" means a net enclosure used to contain finfish;

"officer" has the same meaning as in section 1 of the *Waste Management Act;*

"operational monitoring" means gathering information as discussed in Schedule B;

"operator" means a person who oversees the operation of a facility and who

(a) owns the facility, or

(b) is authorized by the owner to act for the owner respecting the operation of the facility;

"peak biomass" means maximum biomass of finfish within a facility during a production cycle;

"perimeter of containment structure" means the outside edge of the containment structure wherever the structure is located at the time of sampling;

"probable footprint" means the likely footprint associated with proposed locations of containment structures, or containment structure arrays, determined by using a method which satisfies the criteria in Schedule B or by using an alternative method approved by a manager;

"production cycle" means the period of time from stocking the containment structures to the time of harvest or removal of all finfish from the containment structures;

"qualified professional" means an applied scientist or technologist acting within that profession's field of professional practice who

(a) is registered in British Columbia with an appropriate professional association, acts under that professional association's code of ethics, and is subject to disciplinary action by that professional association, and

(b) through suitable education, experience, accreditation and knowledge may be reasonably relied on to provide advice in designing and conducting aquatic impact assessment programs;

"reference station" means a sampling station

(a) within 0.5 to 2.0 kilometres from the tenure,

(b) having the same types of habitats and similar hydrographic, physical and morphological characteristics as the facility sampling stations, and

(c) representing background variation;

"sampling station" means a location where samples are taken or variables are measured or observed;

"soft bottom" means a seabed composed of gravel, sand, mud or similar materials that can be sampled using sediment grab sampling devices;

"statistically significant" means an observed effect so large that it would rarely occur by chance as described in Section 7 of Protocols for Marine Environmental Monitoring (WLAP 2002);

"taxon richness" means the number of taxa in the benthic community at the Linnaean classification system level of

(a) family, for soft bottoms, and

(b) class, for hard bottoms;

"tenure" means

(a) a contiguous area of land that is owned, leased or otherwise lawfully occupied by a person, or

(b) areas of land whether contiguous or not that are occupied under a single

(i) lease, or

(ii) licence of occupation

granted under the *Land Act* for a facility;

"WLAP" means the Ministry of Water, Land and Air Protection of British Columbia;

"wastes" includes finfish feed, finfish faeces, mortalities, bloodwater, materials from net washing, disinfectants, refuse and domestic sewage;

"zero metre station" means a fixed, DGPS location, at the perimeter of the containment structure and on each transect described in Schedule B measured at higher high water referenced to chart datum.

Introduction of waste into the environment

2 Waste may be introduced within a tenure into the environment in accordance with this regulation.

Registration

3 (1) The operator of a facility that commences operation for the first time on or after the date this regulation comes into force must have monitored the facility in accordance with Schedule A before applying for registration of the facility under this regulation.

(2) Subject to subsection (3), an operator must not stock a facility with finfish unless the facility is registered under this regulation.

(3) An operator must apply to a manager for registration of a facility under this regulation,

(a) if the facility was in operation before this regulation was enacted, within 90 days after the coming into force of this regulation, and

(b) if the facility commences operation on or after the date this regulation comes into force, on or before commencement of operation of the facility.

(4) The application for registration under subsection (3) must be submitted directly to the manager in electronic form, or in another form and manner acceptable to the manager, and must include:

(a) the business name, mailing address, telephone number and fax number of the operator;

(b) the registered name and address of the operator;

(c) the common name and geographical description of the facility;

(d) location maps showing

(i) general location of the facility at 1:50 000 to 1:150 000, and

(ii) geo-referenced location of the facility to Crown lands tenure of the facility on British Columbia Geographic System (cadastral) map at 1:20 000;

(e) a 1:5 000 scale aerial view diagram showing the tenure boundaries and the proposed layout of all structures at the site;

(f) the aquaculture licence number issued under the *Fisheries Act;*

(g) the aquatic land tenure file number issued under the *Land Act;*

(h) in accordance with the provisions of Schedule A of this regulation,

(i) baseline inventory including currents information, if the facility commences operation after the coming into force of this regulation, and

(ii) currents information for existing facilities for which this information has not yet been provided under the Interim Monitoring Program conducted in 2000 and 2001 for WLAP;

(i) the design production rate in tonnes for each production cycle and the number and species of finfish to be stocked;

(j) the planned monthly feeding summary over the production cycle and stocking densities;

(k) the number and dimensions of containment structures to be used;

(l) the total dry weight of feed usage in tonnes, for the production cycle prior to registration, or, for new facilities, the estimated dry weight feed in tonnes expected to be used for the first production cycle of operation;

(m) further information if any specified by the manager.

(5) If the information described in subsection (4) is included in the management plan for an aquaculture licence under the *Fisheries Act,* the management plan may be submitted as the application to register under subsection (3).

(6) The manager may give written notice to a person within 30 days of receipt of an application from the person requiring that the application be revised to conform to the requirements of this regulation.

(7) Registration under this section takes effect on the later of

(a) the date the application is received by the manager, or

(b) if written notice is given under subsection (6), the date the manager is satisfied with the revisions to the application.

(8) An operator must, within 30 days of changes to the information submitted under subsection (4), submit revised information to the manager in the form and manner required by subsection (4) for

(a) a change in information described in subsection (4) (a) to (g),

(b) a change of 20% or more to parameters described in subsection (4) (i) or (j), and

(c) a change of 20% or more to volume of containment structures described in subsection (4) (k).

Production cycle standards for sites with soft bottoms

4 (1) Effective September 21, 2003, and subject to section 11 (2), the mean free sulphide concentration at a facility sampling station on a soft bottom at or beyond 30 metres from the zero metre station must not be statistically significantly greater than 6 000 micromolar.

(2) Effective September 21, 2003, and subject to section 11 (2),

(a) the mean taxon richness at a facility sampling station on a soft bottom at or beyond the tenure perimeter must not be statistically significantly different than the mean reference or baseline taxon richness, and

(b) the mean total abundance at a facility sampling station on a soft bottom at or beyond the tenure perimeter must not be statistically significantly different than the mean reference or baseline total abundance.

Chemical trigger for sites with soft bottoms

5 Effective September 21, 2003, and subject to section 11 (2), if at a facility sampling station on a soft bottom at or beyond the tenure perimeter the mean free sulphide concentration is statistically significantly greater than the mean reference or baseline sulphide concentration, the operator must

(a) conduct biological monitoring in accordance with section 9 (3) and (4), and

(b) comply with the pre-stocking requirement in section 6 (3).

Pre-stocking requirements for sites with soft bottoms

6 (1) Effective March 21, 2004, and subject to section 11 (2), if at a facility sampling station on a soft bottom at or beyond 30 metres from the zero metre station the mean free sulphide concentration is statistically significantly greater than

(a) 1 300 micromolar, and

(b) the mean reference or baseline sulphide concentration,

and does not exceed the standard in section 4 (1), the operator must not stock the facility until the mean sulphide concentration at each of these stations is not statistically significantly greater than

(c) 1 300 micromolar, or

(d) the mean reference or baseline sulphide concentration.

(2) Effective March 21, 2004, and subject to section 11 (2), if at a facility sampling station on a soft bottom at or beyond 30 metres from the zero metre station the mean free sulphide concentration exceeds the standard in section 4 (1), the operator must not stock the facility until the following criteria are met:

(a) the mean free sulphide concentration at each sampling station located at the perimeter of the containment structure is not statistically significantly greater than 1 300 micromolar or statistically significantly greater than the mean reference or baseline sulphide concentration;

(b) biological samples are obtained, analyzed and reported from each sampling station in accordance with section 9 (3) and (4).

(3) Effective March 21, 2004, and subject to section 11 (2), if at a facility sampling station on a soft bottom at or beyond the tenure perimeter the mean free sulphide concentration exceeds the trigger in section 5, the operator must not stock the facility until the mean free sulphide concentration at each station located at the tenure perimeter is not statistically significantly greater than the mean reference or baseline sulphide concentration.

Domestic sewage

7 Effective 180 days after this regulation comes into force, an operator must ensure that domestic sewage produced from the facility complies with the following requirements:

(a) the sewage discharge is exempted under section 2 of B.C. Reg. 129/99, the Waste Management Act Municipal Sewage Regulation;

(b) the following apply:

(i) the maximum daily discharge rate does not exceed 2.5 m^3/day;

(ii) the domestic sewage is treated by

(A) a septic tank designed with a retention time of not less than 2 days prior to discharge, or

(B) a device other than a septic tank with the concentration of total suspended solids in the effluent not exceeding 130 mg/L;

(iii) the location of the sewage discharge point to the environment is at a depth no less than 15 metres below the surface of the water;

(iv) all records related to the construction, operation and maintenance of sewage treatment and disposal works are retained for inspection by the manager or an officer.

Best management practices plan

8 (1) Effective 180 days after the coming into force of this regulation, an operator must implement a Best Management Practices Plan for the operation and maintenance of the facility consistent with the following objectives:

(a) compliance with the requirements in sections 5 and 6 and the standards in section 4;

(b) continual reduction of the discharge or potential discharge of the number and quantity of wastes and pollutants;

(c) management of potentially harmful materials including therapeutants, therapeutic additives, anaesthetics, disinfectants, pesticides, wood preservatives, antifouling agents, bloodwater and net-cleaning wastes and wastewater to preclude spillage to the environment, and capacity to respond appropriately in the event of a spill;

(d) continual improvement in the feed conversion ratio for feed fed to finfish;

(e) prevention of the spillage of feed into the environment outside the containment structures;

(f) prevention of the attraction and access of wildlife to feed, foodstuffs and mortalities;

(g) prevention of access to containment structures by wildlife;

(h) collection of mortalities and their disposal in a timely fashion only as authorized under the *Waste Management Act* using equipment and locations that

(i) preclude spillage to the environment, and

(ii) minimize odours during storage and transportation;

(i) management in accordance with a fish kill contingency plan.

(2) The BMP must include the following:

(a) a description of specific management practices and standard operating procedures used to achieve the objectives in subsection (1);

(b) a finfish kill contingency plan;

(c) a statement that the BMP has been reviewed and endorsed by the operator and reviewed and understood by the individuals responsible for implementation of the plan.

(3) An operator must

(a) keep a copy of the BMP at the facility and make the plan available, on request, to the manager or an officer, and

(b) amend the BMP whenever there is a change in the facility which materially increases the release or potential release to the environment of harmful materials referred to in subsection (1) (c).

(4) If the manager provides a written opinion to the operator that a BMP is ineffective in achieving the objectives required by subsection (1), the operator must revise the BMP to ensure that the objectives are met.

Monitoring

9 (1) An operator must monitor the facility by

(a) surveys of hard bottoms, and

(b) sediment grab sampling of soft bottoms

at all sampling stations in accordance with Schedule B within 30 days of peak finfish biomass for each production cycle.

(2) If containment structures are relocated during a production cycle prior to conducting the monitoring required in subsection (1), the vacated site must be monitored in accordance with Schedule B within 30 days of relocating the containment structures.

(3) If the mean free sulphide concentration at a facility sampling station exceeds a level specified in section 4 or 5, the operator must repeat sulphide monitoring and undertake sediment biological sampling

(a) at least once within 30 days of the date on which the excess was measured,

(b) so that the repeat monitoring and biological sampling take place within 7 days of each other,

(c) at the same stations where the specified level was exceeded, and

(d) in accordance with Schedule B.

(4) An operator must conduct monitoring prior to stocking to confirm compliance with pre-stocking criteria in section 6 if any of the mean free sulphide concentration levels described in section 6 occur, as follows:

(a) if section 6 (1) applies, by conducting sulphide monitoring at the same stations where the specified sulphide level was exceeded;

(b) if section 6 (2) applies, by conducting

(i) sulphide monitoring at the sampling stations located at the perimeter of the containment structure, and at 30 metres from the zero metre station, and

(ii) biological monitoring at the sampling stations at 30 metres from the zero metre station,

which are on the same transects as the stations where the specified sulphide level was exceeded;

(c) if section 6 (3) applies, by conducting sulphide and biological monitoring at each station located at the tenure perimeter where the specified sulphide level was exceeded.

(5) If a containment structure is relocated back to a fallow footprint, the operator must conduct monitoring at the perimeter of the containment structure to confirm compliance with pre-stocking criteria in section 6 (2) (a) prior to stocking the containment structure.

(6) An operator must have the biological samples that are collected under subsections (3) and (4) taxonomically identified to level of family by a taxonomist accredited to perform this analysis, or by another method approved by the manager.

(7) Despite subsection (3) (a), an operator may apply to the manager to vary the requirements of that subsection for one of the following reasons:

(a) weather conditions make it impractical to sample within 30 days of the sulphide levels specified in subsection (3) being exceeded;

(b) other legitimate reason for extending the sampling periods.

(8) The monitoring and sampling procedures must be designed and supervised by a qualified professional retained by the operator until a manager gives written confirmation that the continuing supervision may be done by trained staff or a contractor.

Reporting

10 (1) An operator must report by electronic transmission directly to the manager and in a format acceptable to the manager the monitoring results in a document dated and signed by the person supervising as required under section 9 (8).

(2) The report under subsection (1) must be submitted

(a) within 30 days of monitoring for physical and chemical parameters under section 9 (1),

(b) within 90 days of monitoring by surveys for hard bottoms under section 9 (1), and

(c) within 6 months of collecting samples submitted for taxonomic identification by an accredited laboratory, under section 9 (6), and within 14 days of receipt of the results from the taxonomist.

(3) Despite subsection (2), an operator must report to the manager, within 14 days of obtaining monitoring results, if the standards or trigger in section 4 or 5 are exceeded.

(4) An operator must report by January 31 in every year the total dry weight and type of feed, including additives, used the previous calendar year.

(5) An operator must report by March 31 in every year the following for the previous calendar year:

(a) the names of all materials that are directly or indirectly released into the water during the reporting period, including therapeutants, pigments, hormones, pesticides, anaesthetics, antifouling agents, disinfectants, cleansers, therapeutic additives and zinc formulations;

(b) a summary of containment structure dimensions;

(c) the number of mortalities and disposal method used during the reporting period;

(d) a summary of monthly finfish biomass for each month during the reporting period.

(6) An operator must report fish kills to the manager within 24 hours of invoking a fish kill contingency plan.

Management changes and remediation for soft bottoms

11 (1) If the standards described in section 4 are exceeded, the operator must prepare and submit to the manager within 30 days of becoming aware of the excess, and immediately thereafter implement, a remedial action plan which shows how the pre-stocking criteria in section 6 will be met and how deviations exceeding the standards will be avoided in future production cycles.

(2) Despite subsection (1), if containment structures are relocated within the same tenure and provided the footprint at the new location does not overlap the footprint at the previously stocked locations, the footprint of the previously stocked locations will be considered fallow and will be exempt with regards to determining compliance with sections 4 and 6 for the production cycles at the new location.

Annual fees

12 (1) An operator must pay an annual fee by March 31 each year for each registration under section 3 that the operator holds for all or part of the preceding calendar year.

(2) For the purposes of calculating an annual fee under subsection (1), sections 1 and 3 and Schedule C of B.C. Reg. 299/92, the Waste Management Permit Fee Regulation apply as though

(a) the operator was a permit holder, and

(b) the registration under section 3 was a permit.

(3) For the purposes of calculating the amounts of suspended solids, ammonia and nitrogen and

nitrates discharged at a facility during a calendar year,

(a) **"suspended solids"**, **"ammonia"** and **"nitrogen and nitrates"** have the same meaning as in section 1 of B.C. Reg. 299/92, and

(b) each dry weight metric tonne of feed used at the facility, as reported under section 10 (4), in the calendar year shall be equated to an annual discharge at the facility of

(i) 186 kg of suspended solids,

(ii) 36 kg of ammonia, and

(iii) 8 kg of nitrogen and nitrates.

(4) Despite section 3 of B.C. Reg. 299/92, an annual fee under this section is only payable for the suspended solids, ammonia and nitrogen and nitrates calculated under subsection (3) for the facility for the portion of the preceding calendar year for which the facility was registered under section 3 of this regulation.

Offences and penalties

13 (1) An operator must not knowingly

(a) make or participate in, authorize or acquiesce in the making of a false or deceptive statement in a document made or filed under this regulation, or

(b) omit or authorize, or acquiesce in the omission of entries required by this regulation to be included in a document made or filed under this regulation.

(2) Contravention of subsection (1) is an offence punishable by a fine not exceeding $100 000.

(3) An operator who contravenes section 3 (1), (2) or (8), 4, 5, 6, 7, 8 (3), 9 (1), (2), (3), (4), (5), (6), or (8), 10, 11 (1) or 12 commits an offence punishable by a fine not exceeding $200 000.

(4) Each day an offence under subsection (3) continues constitutes a separate offence.

Schedule A — Baseline Inventory

Part I — Currents Metering

The following ocean currents metering information is required for registration.

The currents regime at the site must be characterized at 2 depths: approximately 15 metres below the surface and approximately 5 metres above the bottom. Current direction must be measured in degrees true and current speed in centimetres per second. Speed and direction must be recorded at least once every 30 minutes for a period of at least 30 days. The locations where currents are metered must represent currents within the tenure, especially near containment structures and containment structure arrays. Follow the protocols for collecting currents data that appear in Section 1 of Protocols for Marine Environmental Monitoring (WLAP 2002).

Part II — Baseline Monitoring

A. Seabed Characterization

A baseline survey of the seabed within the tenure and at at least 2 reference stations is required. The baseline survey must achieve the following objectives:

- describe variation in substrata, topography and bathymetry throughout the tenure and at reference stations
- locate reference stations with similar depths, substrata and other features
- determine the feasibility of collecting sediment grab samples and identify areas that need video survey for operational monitoring
- collect physical and biological data to compare with data collected during the operational period and to estimate the number of samples needed for operational monitoring.

Surveys of the probable footprints for all proposed locations of the containment structures, or containment structure arrays, are required. They must include enough transects to map all biophysical characteristics to a resolution of 50 metres. To describe depth variation, at least one transect must run perpendicular to the shore starting from the landward boundary of the tenure and running to its opposite perimeter.

B. Video Survey

Each reference station must have 2 video transects, each at least 100 metres long, including one perpendicular to shore. The transects must run straight, with start and end points recorded for future reference.

Surveys must characterize substratum types as bedrock, boulder (>256 millimetres in diameter), cobble (64-256 millimetres in diameter), gravel (2-64 millimetres in diameter), sand (0.0625-2 millimetres in diameter), silt, mud and clay (<0.0625 millimetres in diameter), or shell hash. For combination substrata, relative proportions must be noted (e.g. 50% bedrock: 50% boulder). Some will have associations of organisms or other features which must be identified.

In areas where sediment grab sampling is not possible, the abundances of megafauna, macrofauna and macrophytes must be measured. For megafauna, record moving images along transects. For macrofauna, take still images of quadrats. For macrophytes, use both. There must be enough quadrats to adequately represent each substratum type within all probable footprints. At reference stations, 5 quadrats must be sampled midway on the transects. All images, whether moving or still, must be clear enough for counting and measuring the biota cover. All biota must be taxonomically identified to at least the level of class.

Sediment colour and the presence or absence of fish feed, fish faeces, flocculent organic material, macrophytes, terrigenous material and farm litter must also be recorded for each transect and quadrat. These observations are needed for proper comparison with observations made during operational monitoring. Unique seabed features or areas of interest must also be mapped.

The baseline survey must follow the protocols for video surveys in section 2 of Protocols for Marine Environmental Monitoring (WLAP 2002) unless an alternative method has been authorized by the manager, and the alternative method will meet the objectives for the baseline survey set out at the beginning of this Part.

C. Sediment Sampling

Following conduct of the video or alternate survey, sediment grab sampling is required wherever physically possible.

Grab sampling obtains physical, chemical and biological data to be used to determine the number of samples needed for operational monitoring and to be compared against the operational data. Within each of the probable footprint or accumulated probable footprints a minimum of 3 grab samples must be taken for each sediment type and if only one sediment type is present, then a minimum of 5 grab samples must be taken. Two reference stations must be selected (as described for video surveys above) and at least 3 grabs must be taken at each reference station. Follow the sediment sampling protocols in Sections 3 and 4 of Protocols for Marine Environmental Monitoring (WLAP 2002).

The following physical and chemical parameters must be measured whenever a sediment grab sample is taken:

- free sulphides*
- redox potential*
- total volatile solids or total organic carbon
- sediment grain size (% gravel, sand, silt, mud and clay)
- total zinc (at sites where zinc is used in feed formulations)
- total copper (at sites where copper is used as an antifouling agent)
- other contaminants (if required by the manager) such as pesticides, therapeutic additives, therapeutants, pharmaceuticals, wood preservatives and persistent organic compounds
- other parameters if required by the manager.

* Follow the protocols for measuring free sulphides and redox potential in Sections 5 and 6 of Protocols for Marine Environmental Monitoring (WLAP 2002).

Record this additional information:

- sediment colour, odour and texture
- presence or absence of gas bubbles, Beggiatoa, fish feed, fish faeces, flocculent organic material, macrophytes, terrigenous material and farm litter.

Biota must be taxonomically identified to the level of species and counted. Also identify and count individuals of Capitella. After being processed, samples must be archived for at least 5 years. These samples must be properly stored and maintained.

Part III — Reporting

The location of each substratum type, currents metering, facility sampling stations, reference stations and transects must be reported on maps. Appropriate scale must be used for easy identification. Qualified professionals providing positional information must be aware that DGPS is not always available to adequate resolution (± 10 m) because of the topography of adjacent land or for other reasons. Therefore, alternative methods of positioning may be needed.

Another map must show depths across the tenure and at reference stations. Map contours must be at a maximum of 10-metre intervals (or equivalent intervals expressed in alternative units). Marine charts may be used, provided that they report the 10-metre depth interval and are accurate for the specific site. However, companies may choose to collect their own bottom contour information if accurate charts are not available, or to be consistent with other information, such as a profile view of the facility.

Data submissions for currents metering (at both depths) must include:

- electronic files of the raw data, indicating current speed and direction for each sampling interval
- hard copies of the summary data presented in tabular frequency distribution.

The data must be provided in an electronic ASCII or MS Excel file format. The data must also be accompanied by adequate reporting information as indicated below. The hard-copy summaries must show current speed and current direction.

Both raw data and summary data must include measurements made between the first and the last good record time only. All data recorded before or after complete deployment of the meter must be removed prior to submission.

Videotape submissions must be accompanied by a detailed narrative or written assessment prepared by a qualified professional describing benthic conditions along transects and in quadrats. The video and report must identify the location of each transect and the location of the camera along each transect.

All physical, chemical and biological data gathered from video surveys and sediment sampling must be submitted in a standard electronic format. Spreadsheet templates, available from WLAP, are to be used for submitting these data and other information. Each data submission must be accompanied by a statement indicating that these Schedules and the Protocols for Marine Environmental Monitoring (WLAP 2002) were followed. If there are any deviations from these, there must also be a written statement justifying the deviations.

Schedule B — Operational Monitoring

The main purposes of operational monitoring are to determine whether a facility meets chemical and biological requirements and standards, and to define the spatial and temporal extent of the facility's effects. All monitoring programs must have the basic study design features described in Section 7 and Appendices of Protocols for Marine Environmental Monitoring (WLAP 2002). Any additional design features must be provided by a qualified professional.

The probable footprint of the waste discharges must be determined prior to designing the impact study. Methods to estimate that footprint may include currents metering, video surveys, sonar techniques, reconnaissance grab sampling, hydrodynamic modeling or other methods.

Part I — Hard Bottom Survey

If satisfactory sediment samples cannot be obtained using grab samplers - because of hard surfaces, rocks or other coarse material - perform a video survey, or an alternative hard bottom survey if an alternative method is approved by a manager, of the footprint or accumulated footprints. Have it analyzed by a qualified professional as described in Schedule A following the methods described in Section 2 of Protocols for Marine Environmental Monitoring (WLAP 2002).

For video surveys, the following 2 types of video surveys must be conducted:

Megafauna transect survey

This identifies and quantifies megafauna and macrophytes from moving images obtained along transects. These transects may also be used to define the extent of observable physical and biological changes, such as sediment colour, presence of organic sediments, feed pellets, farm litter or Beggiatoa mats.

Macrofauna quadrat survey

This consists of still images of quadrats used to identify and quantify macrofauna and macrophytes. These are normally on or adjacent to the megafauna transect.

Each transect must start at the perimeter of the containment structure, or containment structure array, and extend to the perimeter of the tenure, along the prevailing current. There must be one transect for each of 2 dominant current directions of each containment structure or array. If adjacent containment structures, or arrays, are less than 60 m apart, they must be treated as if they were a single array when transects are positioned. A transect must not extend beneath an adjacent containment structure or array.

Alternate transect designs might be acceptable, provided that there is adequate supporting information to show that the transects represent the spatial extent and magnitude of effects, considering the tenure's currents regimes.

For each transect place at least 5 macrofauna quadrats at each of these stations: perimeter of containment structure or array, 30 metres from the zero metre stations and on the perimeter of the tenure.

At least 2 reference stations must be surveyed, with one transect at least 100 metres long at each. These must be the same reference stations as those surveyed during baseline inventory, or for existing sites, established for the Interim Monitoring Program 2000. In the absence of established sites documentation must be provided to show the reference sites meet the criteria in Section 2 B of Protocols for Marine Environmental Monitoring (WLAP 2002).

Data analyses must be performed according to the statistical protocols described in Section 7 of Protocols for Marine Environmental Monitoring (WLAP 2002) to determine whether the facility has had any statistically significant effects.

Part II — Sediment Sampling

Sediment sampling also requires a transect approach. Each transect must start at the perimeter of the containment structure, or containment structure array, and extend along the dominant currents to the perimeter of the tenure. There must be one transect for each of 2 dominant current directions for each containment structure or array. If adjacent containment structures, or arrays, are less than 60 m apart, they must be treated as if they were a single array when transects are positioned. A transect must not extend beneath an adjacent containment structure or array.

Each transect must have sampling stations located at the perimeter of the containment structure at 30 metres from the zero metre station and at the tenure perimeter. A zero metre station must be established for each transect. Each 30 metre station must be located along the dominant current using DGPS.

Alternate transect designs might be acceptable, provided that there is adequate supporting information to show that the transects represent the spatial extent and magnitude of effects, considering the tenure's currents regime(s). Two or more reference stations must be sampled at the same locations as those surveyed for baseline inventory, or for existing sites, established for the Interim Monitoring Program

2000. In the absence of established sites documentation must be provided to show the reference sites meet the criteria in Section 2 B of Protocols for Marine Environmental Monitoring (WLAP 2002).

The following physical and chemical parameters must be measured at the perimeter of containment structures, or of containment structure arrays and at reference stations during operational monitoring:

- free sulphides*
- redox potential*
- total volatile solids or total organic carbon
- sediment grain size (% gravel, sand, silt, mud or clay)
- total zinc (at sites where zinc is used in feed formulations)
- total copper (at sites where copper has been used as an antifouling agent)
- other contaminants (if required by the manager) such as pesticides, therapeutic additives, therapeutants, pharmaceuticals, wood preservatives and persistent organic compounds
- other parameters if required by the manager.

* There are specific protocols for measuring free sulphides and redox potential. Follow all sediment sampling protocols in Sections 3, 4, 5 and 6 of Protocols for Marine Environmental Monitoring (WLAP 2002).

Free sulphide and redox potential monitoring must be also conducted at stations at 30 metres from the zero metre station, and at the perimeter of the tenure.

A minimum of 3 grab samples must be taken at each station. If the mean free sulphide concentration of the 3 grabs at a given facility station exceeds a requirement or standard (not statistically), then 2 additional grabs must be taken for sulphides and redox potential.

Where biological sediment samples are needed, the abundance of infauna and epifauna must be quantified. Within the tenure, at least 5 sediment grabs are needed for each station. At each reference station, at least 3 grabs are needed. Biota must be taxonomically identified to at least the level of family. Also identify individuals of Capitella. After processing, samples must be archived for at least 5 years. These samples need to be properly stored and maintained.

Perform data analyses according to the protocols described in Section 7 of Protocols for Marine Environmental Monitoring (WLAP 2002) to determine whether the facility has had any statistically significant effects.

Part III — Reporting

Reporting must be carried out in the same manner and to the same extent as set out in Part III of Schedule A.

Note: this regulation replaces B.C. Reg. 470/88

[Provisions of the *Waste Management Act*, R.S.B.C. 1996, c. 482, relevant to the enactment of this regulation: section 57]

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Procedure for Oral Hearings concerning Licence Sanctions under the British Columbia *Fisheries Act* (sections 18 & 19)

All proceedings under sections 18 or 19 of the British Columbia *Fisheries Act* must follow the rules of administrative fairness. Most importantly, the licensee or applicant (the "Licensee") must be told of the case against them and given the opportunity to respond to it.

Even though section 18 of the British Columbia *Fisheries Act* only requires a hearing if the licensee requests one and section 19 is silent about hearings, the better approach in all cases in which licence privileges are in jeopardy under section 18 or section 19 is to proceed by way of hearing, with notice to the Licensee.

If a Fisheries Inspector or Aquaculture Inspector believes a licence suspension or revocation under section 18 of the British Columbia *Fisheries Act* may be warranted, they should provide a copy of an investigation report to the Chief Inspector and the Manager, Licensing and Compliance Branch (the "Manager").

If a Fisheries Inspector or Aquaculture Inspector believes the past conduct of a person or company warrants refusal of licence renewal under section 19 of the British Columbia *Fisheries Act*, they should consult with the Chief Inspector and the Manager.

In either case, if the Manager believes that the allegations can be proven on a balance of probabilities, the Manager should refer the matter to the Minister or Deputy Minister as the Decision-maker. The Manager should specify what action the Manager wishes the Decision-Maker to take and provide the Decision-maker with allegations (the less detail the better) sufficient to persuade the Decision-maker to convene a hearing.

If the Decision-maker does not elect to convene a hearing, the Manager should consider any other actions available in the circumstances.

If the Decision-maker elects to proceed by way of oral hearing in determining whether to suspend, revoke, or refuse to reissue a licence under the British Columbia *Fisheries Act*, the following procedure applies:

1. The Decision-maker should give written notice of the hearing to the subject Licensee and send a copy of that notice to the person who will present the case (the "Presenter") for the provincial government (the "Government") and against the Licensee at the hearing. The Decision-maker should ensure that the Licensee receives the notice at least 45 days in advance of the proposed hearing date. The notice should contain the following:

1.1. notice of the Decision-maker's intent to conduct a hearing on a specified date to determine whether to suspend, revoke, or refuse to reissue, as applicable, the Licensee's identified licence. The notice should make it clear that the hearing may proceed even if the Licensee does not attend.

1.2. the allegations made by the Presenter against the Licensee.

1.3. a reminder that at the hearing the Licensee may be represented by counsel.

1.4. the name, address, telephone number and fax number of the Presenter and a request to the Presenter, by copy of the notice, to supply the Licensee with details of the allegations.

1.5. a copy of the British Columbia *Fisheries Act* and these procedures.

2. The Decision-maker may set a new hearing date on receipt of a reasonable request for adjournment or if the Decision-maker during the course of a hearing requires additional information.

3. The Manager should arrange for a Presenter to make the case for the Government. This may be a lawyer, Fisheries Inspector, Aquaculture Inspector, or other official from the Government.

4. The Presenter should disclose all relevant documents to the Licensee at least 20 days before the hearing. "Documents" include correspondence, compliance inspection reports, articles, photographs, maps, charts and any other materials such as legislation, policies, or case law that the Presenter plans to present, refer to, or rely on at the hearing.

5. The Presenter should disclose to the Licensee at the same time as all relevant documents a list of witnesses to be called by the Presenter at the hearing.

6. The Presenter should provide three copies of all relevant documents at the time and place of the hearing so that there is one copy available to be entered as a formal exhibit, one copy for the Decision-maker, and one copy for the Licensee.

7. The Decision-maker should arrange to hold a hearing in a community or place most convenient to the Presenter and the Licensee and in a room of sufficient size and in such a way that:

7.1. the Decision-maker is seated at a table facing both participants.

7.2. the Presenter is seated at a table facing the Decision-maker.

7.3. the Licensee is seated at a table facing the Decision-maker.

7.4. there is a table with seating for any witnesses.

7.5. there is seating in the room for a reasonable number of other interested persons, unless the Decision-maker exercises his or her discretion to conduct a closed hearing.

8. The Decision-maker should arrange for the following:

8.1. the means to create a permanent audio recording of the hearing.

8.2. counsel for the Decision-maker, if the Decision-maker wishes.

9. The Decision-maker should commence the hearing as follows:

9.1. declare that the hearing has started.

9.2. introduce himself or herself and his or her counsel, if applicable.

9.3. ask the Presenter and the Licensee or person representing the Licensee to introduce themselves.

9.4. ask that all statements be made to the Decision-maker (unless a participant is asking questions of a witness), with only one person speaking at a time.

9.5. ask the Presenter and the Licensee in turn to specify the order they are seeking, the names of their witnesses and to estimate how long their case will take.

10. The Decision-maker should then consider advising the participants of the following, as applicable:

10.1. the statutory authority for the Decision-maker to hold the hearing.

10.2. the swearing or affirming of witnesses is required.

10.3. the participants are free to call witnesses or enter documents, subject to rulings on their relevance.

10.4. all documents, if entered, will be recorded with individual exhibit numbers.

10.5. the Presenter will be called upon first.

10.6. once the case for the Government is complete, the Licensee or Licensee's representative will be heard.

10.7. at the conclusion of the direct examination of each witness, the other participant may cross-examine that witness.

10.8. the Decision-maker may also question a witness at any time, but should wait until after cross-examination is finished in most cases.

10.9. on the request of a participant or on the Decision-maker's initiative, a witness may be requested to wait outside the hearing room prior to giving his or her evidence.

10.10. except with leave of the Decision-maker, once a participant's case is made there will be no other opportunity to call evidence.

10.11. except with leave of the Decision-maker, once a witness has stood down there will be no further opportunity to question that witness.

10.12. after presenting evidence, the Presenter will be first to make argument, followed by the Licensee.

11. The Decision-maker should then hear the case. The following procedural sequence should be followed:

11.1. Government's case

11.1.1. opening remarks, if any.

11.1.2. witnesses:

11.1.2.1. swear or affirm to tell the truth.

11.1.2.2. examination by Presenter.

11.1.2.3. cross-examination by Licensee or representative.

11.1.2.4. any final questions from the Decision-maker.

11.1.2.5. re-examination by Presenter, if applicable (only on points arising out of cross-examination or from Decision-maker's questions).

11.2. Licensee's case

11.2.1. opening remarks, if any.

11.2.2. witnesses:

11.2.2.1. swear or affirm to tell the truth.

11.2.2.2. examination by the Licensee or representative.

11.2.2.3. cross-examination by the Presenter.

11.2.2.4. any final questions from the Decision-maker.

11.2.2.5. re-examination by the Licensee or representative, if applicable (only on points arising out of cross-examination or from the Decision-maker's questions).

11.3. Government's argument.

11.4. Licensee's argument.

12. The Decision-maker is not bound to follow the rules of evidence used in courts.

13. The Decision-maker is not bound by his or her previous decisions or the decisions of other administrative agencies. Each case should be decided on its own merits.

14. Hearings will normally be open to the public. The Decision-maker may, however, exercise his or her discretion to conduct a closed hearing if he or she considers it appropriate.

15. When the hearing is concluded, the Decision-maker may announce his or her decision immediately or may reserve.

16. The Decision-maker should provide the participants with written reasons for his or her decision. The Decision-maker is encouraged to do this in a timely way.

17. If a Licensee does not appear at a hearing, but service of the notice of hearing is established, the Decision-maker may hold the hearing in the Licensee's absence.

Approved by:

Gordon Macatee
Deputy Minister
Ministry of Agriculture, Food and Fisheries

Date: Oct 2/2002